Kentucky
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Health Information Exchange

Kentucky Health Information Exchange (KHIE)

Participant Connectivity Guide

Version 1.1

March 10, 2010

Disclaimer

Purpose of the Companion Guide

This companion guide is for use along with the HL-7 messaging standards utilized in the industry to exchange information between Physician Practice Management, Hospital and other Systems. It should not be considered a replacement for the HL-7 Implementation Guide, but rather used as an additional source of information. The companion guide contains data clarifications derived from specific business rules that apply exclusively to the Kentucky Health Information Exchange Initiative (KHIE). The guide includes useful information about sending and receiving data to and from KHIE. In particular this guide's focus is to provide detailed information pertaining to the exchange of the HL-7 / HITSP C32 v2.1 iteration of the Continuity of Care Document (CCD). The specifications contained herein outline the use of the HL7 QRY^T12 message to PULL information from the KHIE and PUSH information (CCD) to the KHIE using the HL7 MDM^T02 message. Information regarding document exchange may be found in the KHIE Companion Guide for Cross Enterprise Document Sharing (XDS) available the first quarter of 2010.

Providers are encouraged to check the KHIE website periodically for updates to the companion guide. URLs will be provided as soon as they are registered and available.

Industry Standards Applied to this Document

HL7 Standard V 2.x
HL7 Standard RIM 0211
HL7 Clinical Document Architecture Framework v2
HITSP C32 Summary Documents using the CCD v2.5
HL7 OID Registry
Systematized Nomenclature of Medicine (SNOMED-CT)
National Drug Code (NDC)
RxNorm
NDF-RT
FDA UNII
Logical Observation Identifiers Names and Codes (LOINC)
International Classification of Disease (ICD-9)
Common Procedure Terminology (CPT and HCPCS)

Revision History

VERSION NUMBER	DATE	DESCRIPTION / LOCATION OF CHANGE
0.0	12/31/07	Initial Draft – EHR Team
0.1	1/8/08	General Team Editing Changes
0.2	4/21/08	Chapter 4 draft – added
0.2	5/3/08	CH 6 - MSH 4 modified to include NPI
0.3	6/3/08	Appendix C and D started
0.4	10/28/09	Update for C32 and new On-Boarding Process
0.5	11/17/09	Update with Onboarding, security cert info for HIE and formatting corrections
0.6	11/23/09	Updates, finalized formatting help desk info added Commonwealth sections added
0.7	12/14/09	Revisions based on feedback from Commonwealth and Team collaborative input
1.0	12/15/2009	First version ready for distribution
1.1	3/10/2010	Changes to contact information and help desk phone number

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At a Glance

This section details high-level information of each chapter's contents. For additional information, refer to the associated chapter. This Companion Guide contains the following chapters:

- Chapter 1 – Introduction

Chapter 1 includes a description of the KHIE Initiative and KHIE Role

- Chapter 2 – Provider Specific Information

Chapter 2 includes information on Enrollment, Participation and contact information

- Chapter 3 – System Registration

Chapter 3 includes information required to register an external system with KHIE

- Chapter 4 – Computer Connection Methods

Chapter 4 discusses various means of connecting with KHIE for data interchange, specifically the HL7 Web Service.

- Chapter 5 – Continuity of Care Document

Chapter 5 provides information about the Continuity of Care Document (CCD)

- Chapter 6 – KHIE Connection and Transmission Service Levels

Chapter 6 provides information about the different service levels of the KHIE

- Chapter 7– Message Transmission and Response

Chapter 6 provides the specifications for the HL7 Messages used to Request and Receive a CCD

- Chapter 8 – Technical Specifications of the CCD

Chapter 7 offers specific information and clarification for system managers and developers to use in conjunction the HL7 Guides.

- Chapter 9 – Testing Procedures for Trading Partners

Chapter 1 Introduction

The Kentucky Health Information Exchange (KHIE) offers the Commonwealth an unprecedented opportunity to advance health information technology and support healthcare providers to coordinate and deliver care more efficiently, improve health patient health outcomes, and improve population health.

1.1 Background

The Kentucky Cabinet for Health and Family Services (CHFS) began development of the KHIE in 2009 with funds received from the Centers for Medicare and Medicaid Services to provide the technical infrastructure for statewide health information exchange (HIE).
The vision for health information exchange in the Commonwealth took on added momentum with the passage of the American Recovery and Reinvestment Act (ARRA) of 2009, which provides a roadmap for transforming the nation's health system through unprecedented investments in the development of a nationwide electronic information system, including state grants for HIE development and financial incentives to healthcare providers who demonstrate meaningful use of health information exchange.

The KHIE, which provides a common, secure electronic information infrastructure for sharing health information across healthcare providers and organizations, is being designed according to national standards to ensure interoperability across disparate health records systems and connectivity to the National Health Information Network (NHIN). The system affords healthcare providers the functionality to support preventative health and disease management through alerts, messaging, and other tools. As criteria for determining meaningful use are established functionality will be added to support providers in achieving meaningful use.

The KHIE will provide a baseline set of functions available across the state, a shared technology infrastructure to support exchange, and promote interoperability among disparate health systems. The KHIE will include interfaces to support data exchange with health care facility systems including electronic prescribing, admission/discharge/transfer (ADT) systems, continuity of care document (CCD) systems, laboratory systems, images, scanned documents, medication histories, allergies and diagnoses, health alerts, etc. It will also provide standardized HL7 messaging, file exchange, web interfaces, support connection to the NHIN, and incorporate national HIE and health information technology (HIT) standards to realize interoperability to its fullest extent. The core components of the KHIE will include a master patient/person index, record locator service, security, provider/user authentication, logging, audits, and alerts.

The KHIE will provide an EMR "Lite" at no cost to providers who lack an electronic medical record system (EMR) to support HIE and serve as an entry point and bridge to full use of an EMR. A patient portal (DirectInformPHR) will enable consumers to access their health information. Use of the KHIE, including the EMR "Lite," will not be restricted to Medicaid providers. The intent is for healthcare providers and organizations to utilize the KHIE as a tool for achieving better health outcomes for all Kentuckians.

The goal of health information exchange is not about providing the technology, but about providing a high level of patient-centered care. The KHIE is not intended to supplant the doctor-patient relationship, but to reduce the administrative burden of a paper records system, freeing the provider to spend more time with the patient. The KHIE's open systems-based health information exchange infrastructure will allow State health-related programs and the Commonwealth's healthcare providers to share information about common recipients and empower providers through the use of an electronic clinical support tool, the Continuity of Care Document (CCD).

The Continuity of Care Document (CCD) will allow healthcare providers to send electronic medical information to other providers via an XLM-based markup standard that specifies the encoding, structure

and semantics of a patient summary clinical document. It provides a "snapshot" in time of clinical, demographic, and administrative data for a specific patient and provides the means for a healthcare provider to transmit pertinent data about a patient to another provider or setting, supporting continuity of care and transfer of clinically-relevant information and data necessary for patient management and monitoring as well as coordination of care for their patients.

The KHIE will support three levels of data exchange: silver, gold, and platinum. The "silver" level allows participants to request and receive a CCD from the KHIE. "Gold" level involves requesting/receiving a CCD ("Silver" functionality) along with sharing CCDs with the KHIE. "Platinum" participants utilize Cross Enterprise Document Sharing (XDS) to register/exchange documents with the KHIE.

1.2 Audience

This Companion Guide is intended for participant (trading partner) and vendor use in conjunction with the HL7 Global Healthcare Messaging Standard v2.x and the HITSP C32 implementation of the Summary Documents using Continuity of Care Document (CCD) (v2.5). This guide outlines the procedures necessary for engaging in Electronic Data Interchange (EDI) with Kentucky Health Information Exchange for the purposes of requesting a CCD and providing a CCD to the exchange.

Participants are defined as any healthcare provider system and their vendors and will fall under the governance of the Kentucky Health Information Exchange.

Partners wishing to connect utilizing the IHE Framework for Cross Enterprise Document Sharing (XDS) are referred to the KHIE Companion Guide for XDS available the first quarter of 2010.

1.3 Glossary of Terms

The following list of acronyms and their definitions are provided to clarify these as mentioned throughout the document.

ASTM – American Society for Testing and Materials
CCD – Continuity of Care Document
CCHIT – Certification Commission for Healthcare Information Technology. The governing board for national certification of IHE (Interoperable Health Care Exchange)
CMS – Centers for Medicare & Medicaid Services
CPT – Common Procedure Terminology
GOEHI – Governor's Office of Electronic Healthcare Information – the government body for the Commonwealth of Kentucky for administering innovations in Healthcare Information technologies
HIE – Health Information Exchange. The practice of being able to send HL7 and X12 transactions between EMRs, Hospitals, and Payer systems on request for a specific patient. This is a virtual network enabled through web services.
HIE Orchestration – Biztalk handles inbound and outbound requests for additional handling and routing of the transactions.
HIMSS – Healthcare Information Management and Systems Society. This is the organization responsible for setting many Healthcare standards in regard to transactions, electronic healthcare and HIPAA compliance.
HIPAA - Health Insurance Portability & Accountability Act of 1996
HL7 – Health Level Seven. One transaction coding standard used in the healthcare market.
HITSP C32 – Health Information Technology Specification. Component 32 - the transaction designation for the continuity of care document (CCD)
KHIE – Kentucky Health Information Exchange.
IHE – IIntegrating the Healthcare Enterprise
LOINC – Logical Observation Identifiers Names and Codes. National standard code set.

MPI – Master Patient Index
OID – Organization Identifier. An object ID used to uniquely identify an object as described in the document. All OID values referenced in the samples are documented in Appendix C.
Onboarding – A term used to indicate a registration process where the participants and their vendors may indicate a security certificate (X509) for connectivity and gain access to the HIE virtual network.
SNOMED CT – Systematized Nomenclature of Medicine Clinical Terms. National standard code set.
XDS – Cross Enterprise Document Sharing.

Chapter 2 Provider / Vendor / Hospital Specific Information

2.1 Provider Enrollment Information

Information for providers wishing to participate in the KHIE may be found at http://chfs.ky.gov/os/goehi/ or inquiries may be emailed to khie@ky.gov.

2.2 Vendor / Hospital Information

Information for EMR vendors and Hospitals wishing to participate in the KHIE may be found at http://chfs.ky.gov/os/goehi/ or inquiries may be emailed to khie@ky.gov.

2.3 KHIE On-Boarding Support

The KHIE Coordinator hosts a weekly interoperability forum teleconference to assist individual vendors and hospitals with technical assistance and testing support. The date and conference number will be provided with the distribution of testing materials and sample messages.

2.4 KHIE Help Desk Support

When a user requests support for resolution of a KHIE problem, there are two levels of escalation: Level 1 and Level 2. Typically, we start with Level 1, a call to the KHIE User Help Desk (UHD) at 1-877-222-3218. The UHD uses various reference tools and makes every effort to resolve the question with a successful outcome. In the instances where more advanced support is required, Level 2, the Technical Help Desk (THD), is engaged to provide advanced subject matter expert resources to support the Commonwealth. We describe below in detail the two levels of escalation.

2.4.1 Level 1–User Help Desk (UHD)

Our UHD, Level 1 in resolving issues related to KHIE, provides first tier system support to end users – putting a human voice to help with questions. Our Help Desk has a proven track record supporting State Medicaid clients, employing individuals trained to assist in the healthcare sector, including those unique concerns specific to the healthcare industry such as HIPAA and PHI. All staff receives regular training on these topics including a mandatory annual assessment required for continued employment.

The UHD serves as the primary triage point for more advanced support requests and escalates calls to the THD as needed. Requests logged at the UHD are graded into one of four severity levels:

Severity 1. Major impact/normal operations cannot be conducted/risk of SLA violation/multiple users impacted

Severity 2. Application/system functionality is limited for multiple end users but still productive

Severity 3. Specific problem/issue for single user; application/system workflow marginally impacted

Severity 4. Normal operations are not impeded; request is an end user inquiry only

Severity 1 items are promoted to the THD for evaluation/resolution.

2.4.2 Level 2–Technical Help Desk (THD)

Severity 1 calls are always promoted/supported by the THD. These items trigger an immediate assembly of key product support teams (KHIE server, network, database operations, and product development teams) via conference call to resolve the issue real-time. Dedicated KHIE Situations Management resources are engaged to oversee the Severity 1 resolution process to insure information is disseminated to outside parties and lessons learned are recorded (for root cause analysis).

The THD is staffed by highly trained IT engineers with a variety of skill sets including operations, network engineering, database administration, Wintel Server Admin, SAN storage, network security and application development. Each product support team (KHIE server, network, database operations and product development teams) supporting the THD maintains a 24 hours a day, 7 days a week on-call process. This allows the THD to reach highly skilled technical support resources outside standard business hours should the need arise. In addition, the THD staffs will outbound/return call non-critical issues to the original requester for more information or with an advanced solution as needed.

Chapter 3 System On-Boarding Process

3.1 KHIE Authentication

The KHIE framework communicates patient record data to and from other connecting systems using individualized (i.e. down to the system and preferably, the location and user) NPI or user id and authenticates the connected system and location then uses this authentication in the Interoperable Exchange process.

With connection to multiple HIE systems for data exchange and for receipt of queries and unsolicited updates; transactions are logged in the security tables, audit logs for patient record access/update, and the system for data source. Data source identifies the organization sending by name, such as ***St Mary's Hospital, Richmond, VA; We Do Labs Laboratory***, or ***NextGen- Dr Mike's Practice.*** Each data source logged has a unique identifier (OID).

3.2 Onboarding Flow Diagrams

The Participant (Partner) Onboarding Flow is shown below:

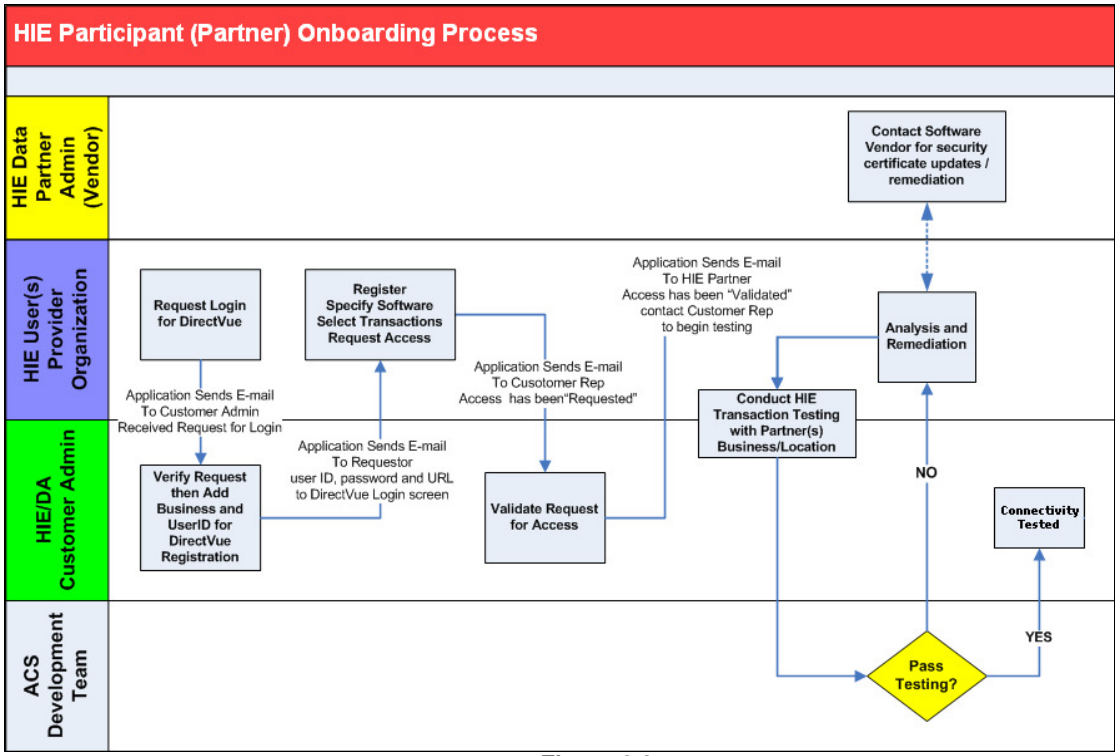

Figure 3.2-1

The Participant's Software Vendor Onboarding Flow is shown below:

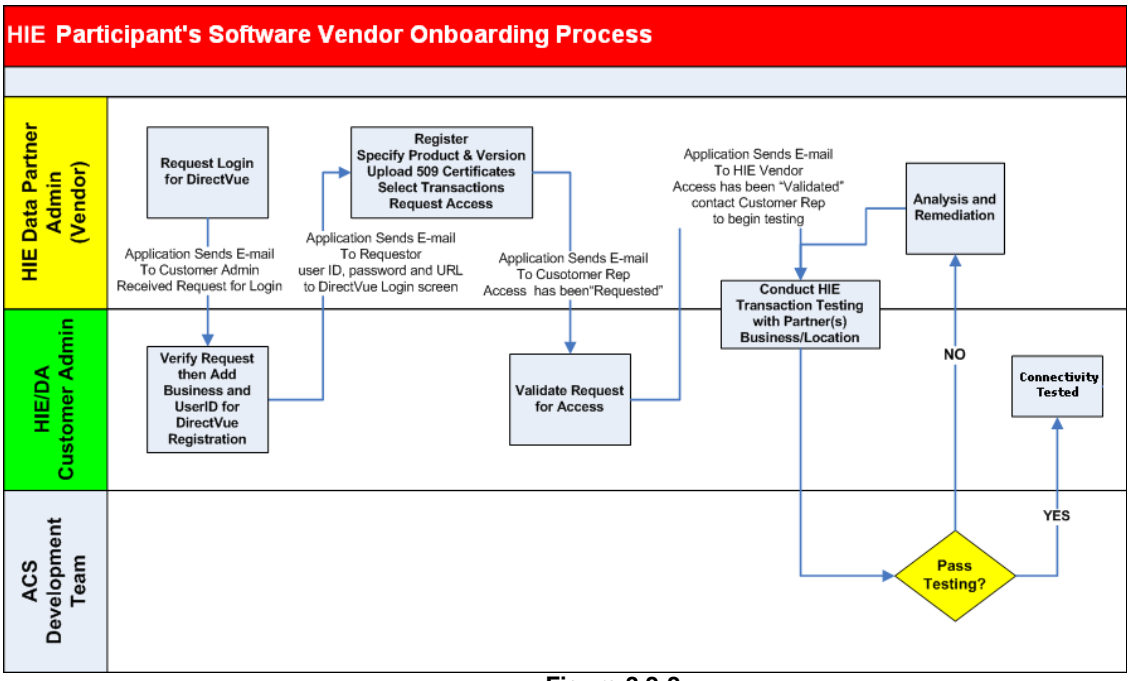

Figure 3.2-2

3.3 Onboarding for Participant/Providers and their Software Vendors

All potential users of the HIE system must register as a Participant on the "Healthcare Partners/Vendor Registration" screen. A web-based, public access Request for Login form is provided that all potential users must complete to request a login for Registration to DirectVue.

Figure 3.3-1

The above is a mock-up – Not the Final Layout

KHIE designated representatives will review all requests for access received. Then, based on verification of the request, they will grant or deny access for registration.

A user interface called DirectVue allows applying Participant/Providers and Software Vendors to access data managed by the KHIE Exchange. Completion of the security application allows the Provider registry to store data that will be used to uniquely identify a provider, and allow the HIE to retain access to information regarding current patients for that provider.

Participant/Providers may register their business with multiple locations for accessing the KHIE network.

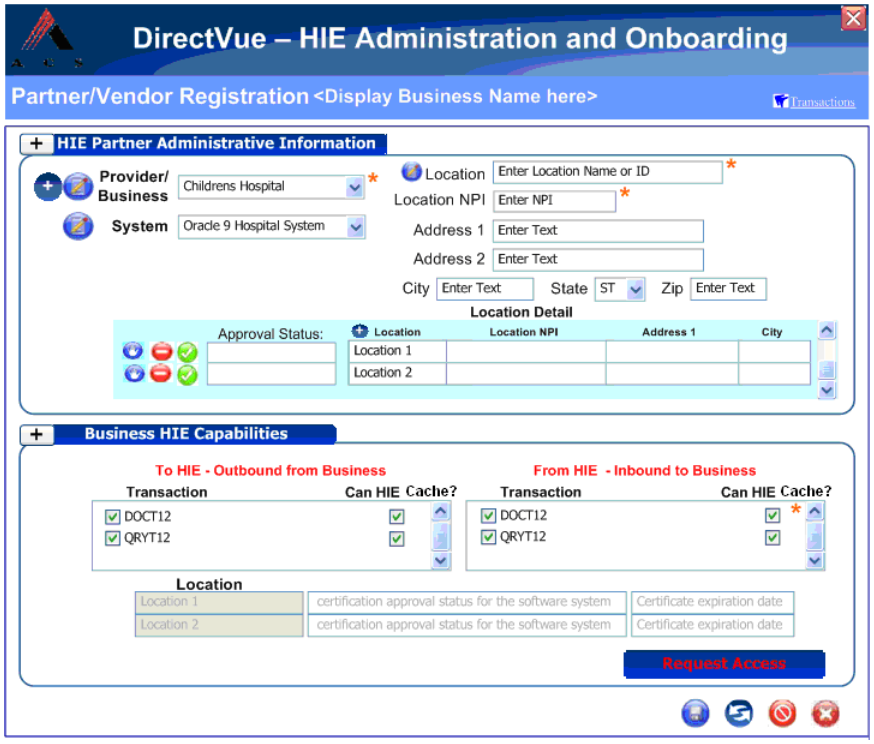

Figure 3.3-2

The above is a mock-up – Not the Final Layout

Software System Vendors may register their business with multiple software products and versions.

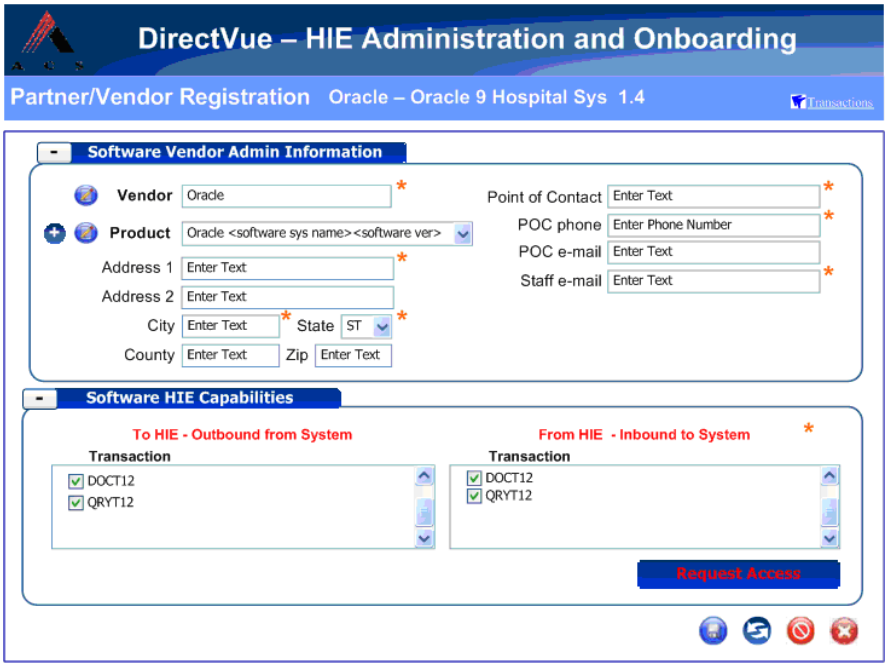

Figure 3.3-3

The above is a mock-up – Not the Final Layout

For each product and version, the Software System Vendor will be expected to upload one to many X509 security certificates for their product(s).

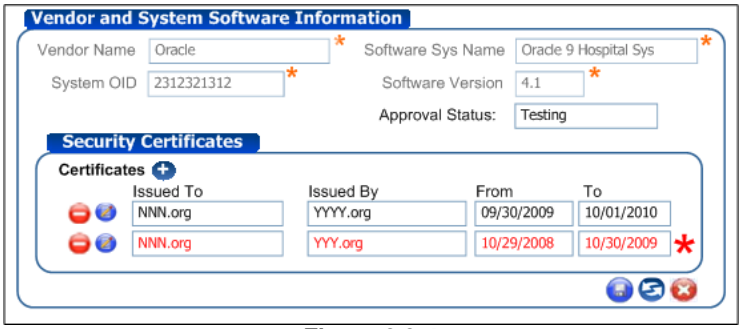

Figure 3.3-4

The above is a mock-up – Not the Final Layout

3.4 Security Certificates

3.4.1 Obtaining an X.509 Security Certificate

The KHIE Service requires the caller to use an X.509 Security certificate that has been issued by a trusted third party certificate authority such as VeriSign. The certificate will authenticate the caller as using a certified EMR Product. The public portion of the certificate must be shared with KHIE in order for the Partner HIE Service to trust the certificate and map it to the EMR Product. This will be done during the EMR Product on-boarding process.
Be sure the check the following things when integrating with the service.

- Ensure the certificate is installed and available on all the computers that are calling the Partner HIE Service.
- Ensure your participant trusts the service's X.509 Certificate.

Ensure that your participant application has access to the client certificate's private key. On a Windows server, this can be granted using the command line program winhttpcertcfg.exe. Use the following arguments "winhttpcertcfg -g -c CertLocation -s SubjectStr -a Account" for example "winhttpcertcfg -g -c LOCAL_MACHINE\My -s TestEMR -a NETWORKSERVICE".

3.5 DirectVue Interface

Once a participant is registered and their connectivity is validated, Functions of the DirectVue Interface will be available for the monitoring of transaction transmission and receipt.

The DirectVue interface allows the applying Participant/Providers to access transactions managed by the KHIE Exchange. The following is the screen for monitoring files received and sent via the KHIE.

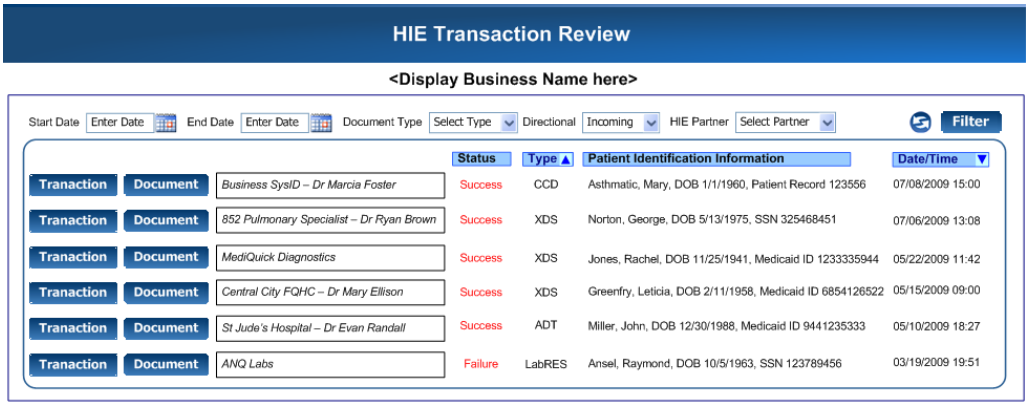

Figure 3.5-1

The above is a mock-up – Not the Final Layout

Through this screen any participant/partner may view documents that have been received (or sent) via one of the transactions transmitted through and logged by the HIE for or by that participant/partner.

DirectVue allows HIE Participant/Partners to review the raw XML transactions, review the types of transactions, their statuses and volume during specified date ranges.

Chapter 4 KHIE Web Service

A registered Internet site for EMR Connectivity is provided for the KHIE. All messages between the KHIE and its participants will be transported via a web service over HTTP and secured using WS security. KHIE currently supports a high bandwidth redundant Internet connection including redundant Internet Service Provider circuits, and redundant network components such as switches and firewalls. Internet bandwidth capacity is provided based upon the unique needs of each project for our participants. It is anticipated that network traffic for this project will utilize existing redundant high-speed Internet connections that currently support the KHIE data center.

4.1 Web Service Operations

The KHIE utilizes Web Service Standards published by the World Wide Web Consortium (W3C). Standards may be obtained from the consortium at www.w3c.org, W3
C A-Z Index.
Specific reference to the following standards are made elsewhere in this document

- SOAP (Simple Object Access Protocol) - www.w3.org/2000/xp/Group/
- WSDL (Web Service Descriptive Language) - www.w3.org/2002/ws/desc/

4.1.1 Service Parameters

Operation: **SendHIEMessage**

Table 4.1.1-1 – Parameters

Type	Name	Required	Description
String	PartnerLocationID	Yes	The 32 character alpha-numeric identifier of the calling location. This ID is assigned during partner on-boarding
String	Either LocationNPI or UserNPI is Required	Conditional	The National Provider ID assigned to the calling practice if UserNPI is not provided
String	Either LocationNPI or UserNPI is Required	Conditional	The National Provider ID assigned to the calling user if LocationNPI is not provided
String	RequestingSystemUserID		The id used to indentify the user in the calling system
String	BusinessName		The name of the calling business
String	MessageSystem	Yes	Message system being sent (HL7 for requesting a CCD)
String	MessageType	Yes	Message type being sent (QRY^T12 for requesting a CCD)
String	Message	Yes	The Web Service consumer will provide an HL7 version 2.4 QRY^T12 requesting a DOC^T12.

Table 4.1.1-2 – Returns

Status	Type	Description
Success	String	The Web Service will return an HL7 version 2.4 DOC^T12 containing the CCD for the requested patient. The DOC^T12 is encoded as follows: 1. CCD is compressed using GZIP 2. CCD is Base64 Encoded 3. CCD is inserted into a MIME Message 4. The carriage return line feeds (0x0d0a) are replaced with the text "\x000d\\x000A". 5. The MIME Message is inserted into a DOC^T12 6. The DOC^T12 is Base64Encoded
Failure	String	The Web Service will return an HL7 version 2.4 DOC^T12 containing an error message in the DOC^T12 for the requested patient. The error messages will be contained in the ERR segment of the Doc^T12.

4.1.2 Error Messaging

There are two methods by which error message will be returned to the consumer through the web service.

- Acknowledge message – 997 with "MSA_1 = AE"

- Error Segment: QRY^T12^ DOC message pair specifies the use of the ERR segment in the response to the consumer since the nature of the process is synchronous.

Basically the error handling logic for WCF * are:

1. If the response message contains "MSA_1 = AE", it means that BizTalk could not parse the participant's message because of bad format, wrong segment name and invalid value.
2. If the response message contain ERR segment and no "MSA_1 = AE", it means that something wrong happen in the process of BizTalk. ERR_1 describes the detailed information about where and what exception was triggered.
3. If the response message contains no ERR segment and "MSA_1 = AE", it means that the message is what the participant expected – a valid response.

* KHIE utilizes Microsoft Windows Communication Foundation

Table 4.1.2-1 – Error Messages

Scenario or Cause		Error Message	Delivery Method	Notes
The incoming QRYT^12 is bad format and could not be parsed		MSA_1 = AE	MSA_1=AE in 997 message	WCF checks if there is MSA_1 = AE If there is, it means BizTalk could not parse the participant's QRYT^12 message
MPI call	MPI is down	Typical http error such as the URL you request was not found	ERR_1	WCF checks if there is ERR segment If there is, See error info in ERR_1
	No such person from MPI search	Patient Not Found	ERR_1	Same as above
	Two more person with the same score from MPI search	Could not decide which patient is right	ERR_1	Same as above
	Time out	Timeout exception is thrown In MPI Search	ERR_1	Same as above
DMart call	Web service is down	Typical http error such as the URL you request was not found	Error log is created in logging database	A valid DOCT^12 may still have been created
	No return from DMart	Calling DMart failed	Error log is created in logging database	Same as above
	Time out	Timeout exception is thrown In DMart call	Error log is created in logging database	Same as above
Clean cache data	Successful or failure	Clean cache Data: failed	ERR_1	WCF checks if there is ERR segment If there is, See error info in ERR_1
Create DOCT^12	Successful or failure	Construct failed	ERR_1	WCF checks if there is ERR segment If there is, See error info in ERR_1

4.2 Web Service Security Specification

KHIE places an understandable emphasis on security and confidentiality of personal health information (PHI.) KHIE is committed to providing a safe and secure environment for all data, technology, and staff. All security plans, policies, and procedures are continually evaluated and updated as necessary. We provide multiple layers of external and internal security that provide administrative, physical, and technical means to protect sensitive or confidential data.

The primary KHIE is based on an n-tier architecture with rack mounted clustered servers for redundant processing capability, scalability and fail-over recovery. Each tier is partitioned with hard firewalls (Cisco PIX 525). All production servers and applications are hosted in our secure Tarrytown, NY data center. The Test environment is housed in the Richmond, VA facility and mimics the production environment. The following narrative provides a brief overview of our implementation.

- Tier 1 DMZ
  - Multiple IIS Servers host ASP NET Web services and pages
  - Load balancing
- Tier 2 DMZ
  - Windows Communication Foundation and SQL Server Reporting Services
- Tier 3
  - Application Servers
  - Secure FTP and Citrix Servers
  - Biz Talk Servers
  - SAN Storage

The WS-Security standards will be used to provide message integrity and confidentiality. Specifically, the CCD Web Service will use direct trust using participant and server X.509 security tokens. The participant security certificate will enable the service to authenticate the caller as a trusted partner. The caller can also verify that the PartnerHIEService Web Service is authentic by validating the server certificate.

4.2.1 Web Service Security (WS-Security)

WS-Security is a collection of open standards governed by OASIS (http://www.oasis-open.org) that describe enhancements to SOAP messaging to provide message integrity and confidentiality.

WS-Security defines the use of digital signatures and encryption headers on SOAP messages and how to attach security tokens to messages. The HIE Service will use Client and Server X509 Certificates to encrypt and digitally sign the SOAP messages. The messages are secured at the message layer using the X.509 Token profile and transmitted over HTTP. The exact web service definition is defined in the WSDL below. There are several technology frameworks that implement the WS-Security standards (for example Microsoft .NET Framework versions 3.0 and later, and Apache Axis2 for Java). For more information about the WS-Security standard please see the following links

The document defining Web Service Security: SOAP Message Security can be found at: http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-SOAPMessageSecurity.pdf.

The document defining Web Service Security: X.509 Certificate Token Profile can be found at: http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-pr-x509TokenProfile-01.pdf.

4.3 Web Service - Implementation

4.3.1 Service Implementation

The Service is implemented in Microsoft .NET Framework 3.0 Windows Communication Foundation (WCF). WCF performs all of the WS-Security functionality. The service is configured with the following settings:

- Binding: **WSHttpBinding**
- Security Mode: **Message**
- Participant Credential Type: **Certificate**
- Client Certificate Validation Mode: **ChainTrust**

4.3.2 Web Service Descriptive Language (WSDL)

KHIE has based the following Web Service Descriptive Language upon on W3C WSDL specification v 1.1 (Version 1). WSDL is the adopted method for exposing resources or services by both the Organization for the Advancement of Structured Information Standards (OASIS -WSRF) and the Web Services Interoperability Organization (WS-I).

WSDL

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions name="PartnerHIEService"
targetNamespace="http://ACS.HIE.ServiceContracts/2009/10"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:wsam="http://www.w3.org/2007/05/addressing/metadata"
xmlns:tns="http://ACS.HIE.ServiceContracts/2009/10"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"
xmlns:wsap="http://schemas.xmlsoap.org/ws/2004/08/addressing/policy"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:msc="http://schemas.microsoft.com/ws/2005/12/wsdl/contract"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:wsa10="http://www.w3.org/2005/08/addressing"
xmlns:wsx="http://schemas.xmlsoap.org/ws/2004/09/mex">
       <wsp:Policy wsu:Id="WSHttpBinding_IPartnerHIEService_policy">
              <wsp:ExactlyOne>
                     <wsp:All>
                            <sp:SymmetricBinding
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                   <wsp:Policy>
                                          <sp:ProtectionToken>
                                                 <wsp:Policy>
                                                        <sp:X509Token
sp:IncludeToken="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy/IncludeToken/Never">
                                                               <wsp:Policy>

       <sp:RequireDerivedKeys/>

       <sp:RequireThumbprintReference/>
                                                                      <sp:WssX509V3Token10/>
                                                               </wsp:Policy>
                                                        </sp:X509Token>
                                                 </wsp:Policy>
                                          </sp:ProtectionToken>
                                          <sp:AlgorithmSuite>
                                                 <wsp:Policy>
                                                        <sp:Basic256/>
                                                 </wsp:Policy>
                                          </sp:AlgorithmSuite>
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                                                 <wsp:Policy>
                                                        <sp:Strict/>
                                                 </wsp:Policy>
                                          </sp:Layout>
                                          <sp:IncludeTimestamp/>
                                          <sp:EncryptSignature/>
                                          <sp:OnlySignEntireHeadersAndBody/>
                                   </wsp:Policy>
                            </sp:SymmetricBinding>
                            <sp:EndorsingSupportingTokens
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                   <wsp:Policy>
                                          <sp:X509Token
sp:IncludeToken="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy/IncludeToken/AlwaysToRecipi
ent">
                                                 <wsp:Policy>
                                                        <sp:RequireThumbprintReference/>
```

```
                                                        <sp:WssX509V3Token10/>
                                                </wsp:Policy>
                                        </sp:X509Token>
                                </wsp:Policy>
                        </sp:EndorsingSupportingTokens>
                        <sp:Wss11
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                                <wsp:Policy>
                                        <sp:MustSupportRefKeyIdentifier/>
                                        <sp:MustSupportRefIssuerSerial/>
                                        <sp:MustSupportRefThumbprint/>
                                        <sp:MustSupportRefEncryptedKey/>
                                        <sp:RequireSignatureConfirmation/>
                                </wsp:Policy>
                        </sp:Wss11>
                        <sp:Trust10
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                <wsp:Policy>
                                        <sp:MustSupportIssuedTokens/>
                                        <sp:RequireClientEntropy/>
                                        <sp:RequireServerEntropy/>
                                </wsp:Policy>
                        </sp:Trust10>
                        <wsaw:UsingAddressing/>
                </wsp:All>
        </wsp:ExactlyOne>
</wsp:Policy>
<wsp:Policy wsu:Id="WSHttpBinding_IPartnerHIEService_SendHIEMessage_Input_policy">
        <wsp:ExactlyOne>
                <wsp:All>
                        <sp:SignedParts
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                <sp:Body/>
                                <sp:Header Name="To"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="From"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="FaultTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="ReplyTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="MessageID"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="RelatesTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="Action"
Namespace="http://www.w3.org/2005/08/addressing"/>
                        </sp:SignedParts>
                        <sp:EncryptedParts
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                <sp:Body/>
                        </sp:EncryptedParts>
                </wsp:All>
        </wsp:ExactlyOne>
</wsp:Policy>
<wsp:Policy wsu:Id="WSHttpBinding_IPartnerHIEService_SendHIEMessage_output_policy">
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                <wsp:All>
                        <sp:SignedParts
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                <sp:Body/>
                                <sp:Header Name="To"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="From"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="FaultTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="ReplyTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                <sp:Header Name="MessageID"
Namespace="http://www.w3.org/2005/08/addressing"/>
```

```
                                        <sp:Header Name="RelatesTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                        <sp:Header Name="Action"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                </sp:SignedParts>
                                <sp:EncryptedParts
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                        <sp:Body/>
                                </sp:EncryptedParts>
                        </wsp:All>
                </wsp:ExactlyOne>
        </wsp:Policy>
        <wsp:Policy
wsu:Id="WSHttpBinding_IPartnerHIEService_SendHIEMessage_DefaultFaultContractFault_Fault">
                <wsp:ExactlyOne>
                        <wsp:All>
                                <sp:SignedParts
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                        <sp:Body/>
                                        <sp:Header Name="To"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                        <sp:Header Name="From"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                        <sp:Header Name="FaultTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                        <sp:Header Name="ReplyTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                        <sp:Header Name="MessageID"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                        <sp:Header Name="RelatesTo"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                        <sp:Header Name="Action"
Namespace="http://www.w3.org/2005/08/addressing"/>
                                </sp:SignedParts>
                                <sp:EncryptedParts
xmlns:sp="http://schemas.xmlsoap.org/ws/2005/07/securitypolicy">
                                        <sp:Body/>
                                </sp:EncryptedParts>
                        </wsp:All>
                </wsp:ExactlyOne>
        </wsp:Policy>
        <wsdl:types>
                <xsd:schema elementFormDefault="qualified"
targetNamespace="http://ACS.HIE.ServiceContracts/2009/10">
                        <xsd:element name="SendHIEMessage">
                                <xsd:complexType>
                                        <xsd:sequence>
                                                <xsd:element minOccurs="0" name="EMRSystemOID"
nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0" name="PartnerLocationID"
nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0" name="LocationNPI"
nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0" name="UserNPI"
nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0"
name="RequestingSystemUserID" nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0" name="BusinessName"
nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0" name="MessageSystem"
nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0" name="MessageType"
nillable="true" type="xsd:string"/>
                                                <xsd:element minOccurs="0" name="Message"
nillable="true" type="xsd:string"/>
                                        </xsd:sequence>
                                </xsd:complexType>
                        </xsd:element>
                        <xsd:element name="SendHIEMessageResponse">
                                <xsd:complexType>
                                        <xsd:sequence>
```

```
                                        <xsd:element minOccurs="0"
name="SendHIEMessageResult" nillable="true" type="xsd:string"/>
                                    </xsd:sequence>
                                </xsd:complexType>
                        </xsd:element>
                </xsd:schema>
                <xsd:schema elementFormDefault="qualified"
targetNamespace="http://ACS.CCD.Facade.FaultContracts/2008/02"
xmlns:tns="http://ACS.CCD.Facade.FaultContracts/2008/02"
xmlns:ser="http://schemas.microsoft.com/2003/10/Serialization/">
                        <xsd:complexType name="DefaultFaultContract">
                                <xsd:sequence>
                                        <xsd:element name="ErrorId" type="xsd:int"/>
                                        <xsd:element name="ErrorMessage" nillable="true"
type="xsd:string"/>
                                        <xsd:element name="CorrelationId" type="ser:guid"/>
                                </xsd:sequence>
                        </xsd:complexType>
                        <xsd:element name="DefaultFaultContract" nillable="true"
type="tns:DefaultFaultContract"/>
                </xsd:schema>
                <xs:schema attributeFormDefault="qualified" elementFormDefault="qualified"
targetNamespace="http://schemas.microsoft.com/2003/10/Serialization/"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://schemas.microsoft.com/2003/10/Serialization/">
                        <xs:element name="anyType" nillable="true" type="xs:anyType"/>
                        <xs:element name="anyURI" nillable="true" type="xs:anyURI"/>
                        <xs:element name="base64Binary" nillable="true" type="xs:base64Binary"/>
                        <xs:element name="boolean" nillable="true" type="xs:boolean"/>
                        <xs:element name="byte" nillable="true" type="xs:byte"/>
                        <xs:element name="dateTime" nillable="true" type="xs:dateTime"/>
                        <xs:element name="decimal" nillable="true" type="xs:decimal"/>
                        <xs:element name="double" nillable="true" type="xs:double"/>
                        <xs:element name="float" nillable="true" type="xs:float"/>
                        <xs:element name="int" nillable="true" type="xs:int"/>
                        <xs:element name="long" nillable="true" type="xs:long"/>
                        <xs:element name="QName" nillable="true" type="xs:QName"/>
                        <xs:element name="short" nillable="true" type="xs:short"/>
                        <xs:element name="string" nillable="true" type="xs:string"/>
                        <xs:element name="unsignedByte" nillable="true" type="xs:unsignedByte"/>
                        <xs:element name="unsignedInt" nillable="true" type="xs:unsignedInt"/>
                        <xs:element name="unsignedLong" nillable="true" type="xs:unsignedLong"/>
                        <xs:element name="unsignedShort" nillable="true" type="xs:unsignedShort"/>
                        <xs:element name="char" nillable="true" type="tns:char"/>
                        <xs:simpleType name="char">
                                <xs:restriction base="xs:int"/>
                        </xs:simpleType>
                        <xs:element name="duration" nillable="true" type="tns:duration"/>
                        <xs:simpleType name="duration">
                                <xs:restriction base="xs:duration">
                                        <xs:pattern value="\-
?P(\d*D)?(T(\d*H)?(\d*M)?(\d*(\.\d*)?S)?)?"/>
                                        <xs:minInclusive value="-P10675199DT2H48M5.4775808S"/>
                                        <xs:maxInclusive value="P10675199DT2H48M5.4775807S"/>
                                </xs:restriction>
                        </xs:simpleType>
                        <xs:element name="guid" nillable="true" type="tns:guid"/>
                        <xs:simpleType name="guid">
                                <xs:restriction base="xs:string">
                                        <xs:pattern value="[\da-fA-F]{8}-[\da-fA-F]{4}-[\da-fA-
F]{4}-[\da-fA-F]{4}-[\da-fA-F]{12}"/>
                                </xs:restriction>
                        </xs:simpleType>
                        <xs:attribute name="FactoryType" type="xs:QName"/>
                        <xs:attribute name="Id" type="xs:ID"/>
                        <xs:attribute name="Ref" type="xs:IDREF"/>
                </xs:schema>
        </wsdl:types>
        <wsdl:message name="IPartnerHIEService_SendHIEMessage_InputMessage">
                <wsdl:part name="parameters" element="tns:SendHIEMessage"/>
        </wsdl:message>
```

```
        <wsdl:message name="IPartnerHIEService_SendHIEMessage_OutputMessage">
                <wsdl:part name="parameters" element="tns:SendHIEMessageResponse"/>
        </wsdl:message>
        <wsdl:message
name="IPartnerHIEService_SendHIEMessage_DefaultFaultContractFault_FaultMessage">
                <wsdl:part name="detail" element="q1:DefaultFaultContract"
xmlns:q1="http://ACS.CCD.Facade.FaultContracts/2008/02"/>
        </wsdl:message>
        <wsdl:portType name="IPartnerHIEService">
                <wsdl:operation name="SendHIEMessage">
                        <wsdl:input wsaw:Action="SendHIEMessage"
message="tns:IPartnerHIEService_SendHIEMessage_InputMessage"/>
                        <wsdl:output
wsaw:Action="http://ACS.HIE.ServiceContracts/2009/10/IPartnerHIEService/SendHIEMessageResponse"
message="tns:IPartnerHIEService_SendHIEMessage_OutputMessage"/>
                        <wsdl:fault
wsaw:Action="http://ACS.HIE.ServiceContracts/2009/10/IPartnerHIEService/SendHIEMessageDefaultFaul
tContractFault" name="DefaultFaultContractFault"
message="tns:IPartnerHIEService_SendHIEMessage_DefaultFaultContractFault_FaultMessage"/>
                </wsdl:operation>
        </wsdl:portType>
        <wsdl:binding name="WSHttpBinding_IPartnerHIEService" type="tns:IPartnerHIEService">
                <wsp:PolicyReference URI="#WSHttpBinding_IPartnerHIEService_policy"/>
                <soap12:binding transport="http://schemas.xmlsoap.org/soap/http"/>
                <wsdl:operation name="SendHIEMessage">
                        <soap12:operation soapAction="SendHIEMessage" style="document"/>
                        <wsdl:input>
                                <wsp:PolicyReference
URI="#WSHttpBinding_IPartnerHIEService_SendHIEMessage_Input_policy"/>
                                <soap12:body use="literal"/>
                        </wsdl:input>
                        <wsdl:output>
                                <wsp:PolicyReference
URI="#WSHttpBinding_IPartnerHIEService_SendHIEMessage_output_policy"/>
                                <soap12:body use="literal"/>
                        </wsdl:output>
                        <wsdl:fault name="DefaultFaultContractFault">
                                <wsp:PolicyReference
URI="#WSHttpBinding_IPartnerHIEService_SendHIEMessage_DefaultFaultContractFault_Fault"/>
                                <soap12:fault name="DefaultFaultContractFault" use="literal"/>
                        </wsdl:fault>
                </wsdl:operation>
        </wsdl:binding>
        <wsdl:service name="PartnerHIEService">
                <wsdl:port name="WSHttpBinding_IPartnerHIEService"
binding="tns:WSHttpBinding_IPartnerHIEService">
                        <soap12:address
location="http://kentuckyhieuat.acsmessaging.com/PartnerHIEService/PartnerHIEService.svc"/>
                        <wsa10:EndpointReference>
        <wsa10:Address>http://kentuckyhieuat.acsmessaging.com/PartnerHIEService/PartnerHIEService
.svc</wsa10:Address>
                                <Identity
xmlns="http://schemas.xmlsoap.org/ws/2006/02/addressingidentity">
                                        <KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
                                                <X509Data>

        <X509Certificate>MIIEtjCCA56gAwIBAgIKMIjOQAAAAAAAFzANBgkqhkiG9w0BAQUFADBNMRMwEQYKCZImiZPy
LGQBGRYDY29tMR8wHQYKCZImiZPyLGQBGRYPZGlyZWN0YWNjZXNzZWhyMRUwEwYDVQQDEwxyaWNobXN0c2NhMDEwHhcNMDkwO
TE1MTUxNTM1WhcNMTEwOTE1MTUyNTM1WjCBmTELMAkGA1UEBhMCVVMxCzAJBgNVBAgTAlZBMREwDwYDVQQHEwhSaWNobW9uZD
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NAQkBFh1jZXJ0YWRtaW5AZGlyZWN0YWNjZXNzZWhyLmNvbTCBnzANBgkqhkiG9w0BAQEFAAOBjQAwgYkCgYEAm9XbnlGkaU2/
TcR/SP0sVFl2Po+DEdz8uOu++2ffx3Llkw66NWu78BmSjkiXV/Gt6KYREAuCLvVbUANYGd9Case2ymOEeVmh10l3G7yU/LIY+
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IE8DBEBgkqhkiG9w0BCQ8ENzA1MA4GCCqGSIb3DQMCAgIAgDAOBggqhkiG9w0DBAICAIAwBwYFKw4DAgcwCgYIKoZIhvcNAwc
wHQYDVR0OBBYEFFQg5l/sk7RJJVvrZmdKiqbh5nlLMBMGA1UdJQQMMAoGCCsGAQUFBwMBMB8GA1UdIwQYMBaAFCzn5O97vTgv
SJRWkA9EmXvnb6weMHMGA1UdHwRsMGowaKBmoGSGL2h0dHA6Ly9yaWNobXN0c2NhMDEvQ2VydEVucm9sbC9yaWNobXN0c2NhM
DEuY3JshjFmaWxlOi8vXFxyaWNobXN0c2NhMDFcQ2VydEVucm9sbFxyaWNobXN0c2NhMDEuY3JsMIGmBggrBgEFBQcBAQSBmT
CBljBIBggrBgEFBQcwAoY8aHR0cDovL3JpY2htc3RzY2EwMS9DZXJ0RW5yb2xsL3JpY2htc3RzY2EwMV9yaWNobXN0c2NhMDE
uY3J0MEoGCCsGAQUFBzAChj5maWxlOi8vXFxyaWNobXN0c2NhMDFcQ2VydEVucm9sbFxyaWNobXN0c2NhMDFfcmljaG1zdHNj
YTAxLmNydDANBgkqhkiG9w0BAQUFAAOCAQEAzQzgpX/YaNWOnZUv/yqUHzJhb+mVPW5bFNtlmHoHiidBq8OWcELo2xekwPREg
i1DWPdDMjIDdKEvugq5oqruaa0b0B3znEEpJ1MmPL0oUIqrT0hTfhwdRgRsVQozTNMPTeF6tyu3aS1Q4Y/rY+fXuGz4P3fzD7
```

bMmy1UNaTqbybV/dhvqVASQ/NVVAOGEu6HhwVGQtrXc1mzT2wjMdYqfxnQtCp9eykbJN+ZptdqAFd7P7wWb/FnF7Yzgl8XpA4
AaFSjL9ir0R+qUzbbSwrVoVbOXwvrekcqnrsDXrwzVDh1Zg+1HYNvdAmAYfKKlleoycIv7TYzECg9MtQlTEMWYQ==</X509Ce
rtificate>
</X509Data>
</KeyInfo>
</Identity>
</wsa10:EndpointReference>
</wsdl:port>
</wsdl:service>
</wsdl:definitions>

4.3.3 EMR Integration Testing

In order to connect to the Kentucky Health Information Exchange, the vendor or organization that wishes to connect to the exchange will submit a request through the system's onboarding portal and will be contacted by a KHIE official to begin the onboarding process. Once accepted as a potential KHIE connection, the KHIE sponsor will contact the requestor, provide testing materials and standards, and work with the vendor to begin the testing process for production connection to the KHIE. The Vendor will then be invited to regular HIE connectivity discussion meetings; where the KHIE representative will work with vendors and providers to discuss connection requirements, support coding and connectivity testing assistance and discuss production issues and questions.

Testing will consist of the following types of testing:

Connectivity Testing – The Business and Software system (Vendor) will work with the KHIE representative to conduct a series of tests to prove that they can establish secure connectivity to the HIE portal.

Transaction Testing – the Business and Software system (Vendor) will work with the KHIE representative to conduct test scenarios around all transactions. Each test transmission is inspected thoroughly to ensure no format errors are present. Testing is conducted to verify the integrity of the format, not the integrity of the data; however, in order to simulate a production environment, we request that you send real transmission data. The number of test transmissions required depends on the number of format errors on a transmission and the relative severity of these errors. Additional testing may be required in the future to verify any changes made to the KHIE system.

The Business and Software system (Vendor) must pass each test scenario prior to being awarded their official validation level for connectivity to the system. Upon completion, vendors will be given access to the HIE production environment for the transactions for which they successfully passed testing.

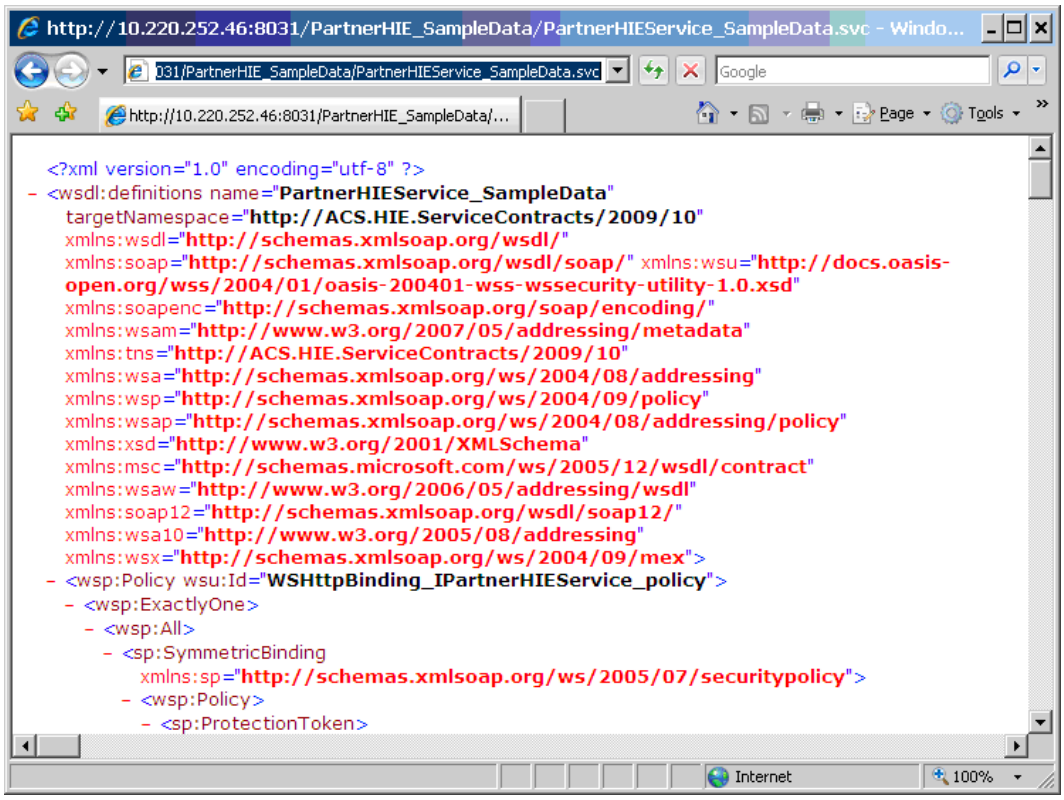
If the Business and Software system (Vendor) wish to allow additional transmissions through the HIE, they must first pass the provided test cases for those transaction(s) and have those additional transactions validated.

The test environment will expose three services to allow a phased approach to calling the KHIE Query Service. First, EMR Systems will make the calls to the open service then secure the calls using WS-Security and the X.509 client certificate.

a. PartnerHIEService_SampleData_Open:
This service returns a fixed value reference CCD that has been packaged and encoded in the same format as the PartnerHIEService. The same DOCT12 will be returned regardless of the incoming message. There is no WS-Security surrounding this service.
The service endpoint will be at the following URL:
http://kentuckyhieuat.acsmessaging.com/PartnerHIEService_SampleData_Open/PartnerHIEService_SampleData.svc

b. PartnerHIEService_SampleData:
This service returns a fixed value reference CCD that has been packaged and encoded in the same format as the PartnerHIEService. The same DOCT12 will be returned regardless of the

incoming message. This service implements the WS-Security using X.509 Security tokens. The service endpoint will be at the following URL:
http://kentuckyhieuat.acsmessaging.com/PartnerHIEService_SampleData/PartnerHIEService_SampleData.svc



c. PartnerHIEService:
This service handles the incoming message and generates the appropriate response. The incoming message is passed to the HIE system. This service implements the WS-Security using X.509 Security tokens.
The service endpoint will be at the following URL:
http://kentuckyhieuat.acsmessaging.com/PartnerHIEService/PartnerHIEService.svc

4.3.4 Consuming the KHIE's PartnerHIEService

a. On every machine that will be connecting to the KHIE Query Service install the participant X.509 Certificate.
b. In an internet browser browse the sites:

1. PartnerHIEService_SampleData_Open:
http://kentuckyhieuat.acsmessaging.com/PartnerHIEService_SampleData_Open/PartnerHIEService_SampleData.svc

2. PartnerHIEService_SampleData:
http://kentuckyhieuat.acsmessaging.com/PartnerHIEService_SampleData/PartnerHIEService_SampleData.svc

3. PartnerHIEService:
http://kentuckyhieuat.acsmessaging.com/PartnerHIEService_SampleData/PartnerHIEService_SampleData.svc

You should be able to view the WSDL (and generate participant using SVCUTIL.exe if using WCF in .NET 3.0 or above)

c. When writing the code to consume the service, ensure that you are using your participant X.509 certificate for PartnerHIEService and PartnerHIEService_SampleData (not needed for PartnerHIEService_SampleData_Open).
d. Make sure the URL for your participants are pointing to the kentuckyhieuat.acsmessaging.com domain.
e. Ensure your participant trusts the service's X.509 Certificate.
f. Ensure that your participant application has access to the client certificate's private key. On a Windows server, this can be granted using the command line program winhttpcertcfg.exe. Use the following arguments "winhttpcertcfg -g -c CertLocation -s SubjectStr -a Account" for example "winhttpcertcfg -g -c LOCAL_MACHINE\My -s TestEMR -a NETWORKSERVICE".

4.3.5 Retrieving the CCD from the DOC^T12

These are the steps for pulling the CCD from the DOC^T12 message.

1. Decode Base64
2. Replace the CRLF with |
3. Find the OBX segment then add 5 to the index
4. That will give you the mime content
5. Find the segment that starts with Content-ID:
6. This is the compressed CCD
7. Decompress using GZip
8. This will give you the CCD

Below is example code in C# that retrieves the CCD:

```
using System;
using System.Collections.Generic;
using System.IO;
using System.Text;
using System.IO.Compression;

public class CCDRetriever
{

public static string GetCCDFromDOC_T12(string doct12)
{
    string decoded;
    string mimeContent;
    string ccdCompressed;
    string ccd = String.Empty;

    try
    {
        decoded = DecodeMessage(doct12);

        decoded = decoded.Replace("\r\n", "|");
    }
    catch (Exception ex)
    {
        return "could not decode the return text:" + doct12;
    }

    try
    {
        List<string> segments = new List<string>(decoded.Split('|'));
        int obxIndex = segments.FindIndex(delegate(string s)
        {
            return s.EndsWith("OBX");
        });
        int ccdIndex = obxIndex + 5;
```

```
        mimeContent = segments[ccdIndex];

        segments = new List<string>(mimeContent.Split(new string[] { @"\x000d\\x000A\" },
StringSplitOptions.None));
        ccdIndex = segments.FindIndex(delegate(string s)
        {
            return s.StartsWith("Content-ID:");
        }) + 1;

        ccdCompressed = segments[ccdIndex];
        ccd = Decompress(ccdCompressed);
    }
    catch (Exception ex)
    {
        return "Could not find and decompress CCD:" + decoded;
    }

    return ccd;
}

private static string DecodeMessage(string encoded)
{
    try
    {
        string decoded;

        //do decoding
        byte[] bytearray = Convert.FromBase64String(encoded);

        UTF8Encoding encode = new UTF8Encoding();

        char[] chararray = encode.GetChars(bytearray);

        decoded = new string(chararray);

        return decoded;
    }
    catch (FormatException e)
    {
        throw new FormatException("Message could not be decoded base64", e);
    }
}

private static string Decompress(string compressedText)
{
    byte[] gzBuffer = Convert.FromBase64String(compressedText);
    using (MemoryStream ms = new MemoryStream())
    {
        int msgLength = BitConverter.ToInt32(gzBuffer, 0);

        ms.Write(gzBuffer, 4, gzBuffer.Length - 4);
        byte[] buffer = new byte[msgLength];
        ms.Position = 0;
        using (GZipStream zip = new GZipStream(ms, CompressionMode.Decompress))
        {
            zip.Read(buffer, 0, buffer.Length);
        }
        return Encoding.UTF8.GetString(buffer);
    }
}
}
```

Figure 4.3.5-1

Chapter 5 Continuity of Care Document

5.1 CCD Scope

The Continuity of Care Document is a structured electronic document exchange standard utilized for sharing patient summary information among providers. It provides pertinent information about patients based upon data obtained from Payer sources, other clinical contributors and the KHIE patient data hub. The data is presented in a format that can be shared between computer applications and can be viewed in a web browser or can be consumed by an electronic medical record.

The CCD was developed as a collaborative effort between ASTM and HL7 and subsequently adopted by the Health Information Technology Standards Panel (HITSP). Technically, the CCD is a fixed content specification (HITSP C32) that utilizes the HL7 Clinical Document Architecture in conjunction with the HL7 Reference Information Model 0211(RIM). Essentially, this is an XML specification that provides a uniform framework for the exchange of summary patient information. The technical specifications for this implementation of the CCD are contained in Chapter 7 of this Guide.

The KHIE will utilize the CCD in 2 different ways

1. To provide information to EMR and Hospital Systems in a consolidated document
2. To receive individual encounter or discharge documents that may be shared with other healthcare providers involved in the patient's care.

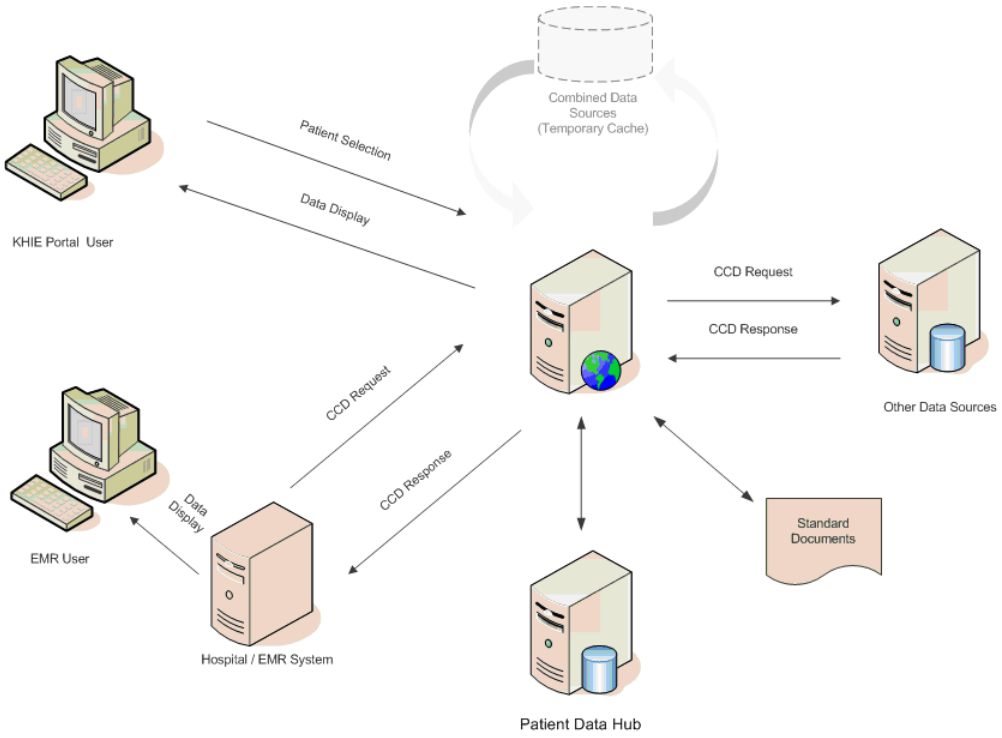


Figure 5.1-1

In both instances, the business process will be supported by the HL7 Global Messaging Standard to request and transport the CCD. Specifications for this use are outlined in Chapter 7 of this guide.

Each time a query is posed to the KHIE from an EMR system or a patient is selected in the KHIE Web Portal, the system will query multiple, various external data sources to obtain updated patient demographics and clinical information. This will be accomplished utilizing the HL7 v2.4 messaging standard. In like fashion, EMR and Hospital systems may request a CCD via KHIE utilizing the same standard message. All information available for the patient, for the time period requested, will be compiled and transmitted to the requesting system. The following table represents the types of data available to ECST and to provider EMR systems. Additional patient information will also be contained in the HL7 Message.

Table 5.1-1

CCD Section	Available from KHIE
Purpose	✓
Problems	✓
Procedures	✓
Family History	✓
Social History	✓
Payers	Future
Advanced Directives	Future
Alerts, Allergies, ADRs	✓
Medications	✓
Immunizations	✓
Medical Equipment	Future
Vital Signs	✓
Functional Status	✓
Result / Observations	✓
Encounters	✓
Plan of Care	Future

Chapter 6 KHIE Connection and Transmission Service Levels

Participation in the KHIE involves many connections and messages moving back and forth to support not only the document exchanges but also features such as the MPI for the KHIE. This document does not cover the other connections and messages since it is focused on CCD exchange.

6.1 Silver

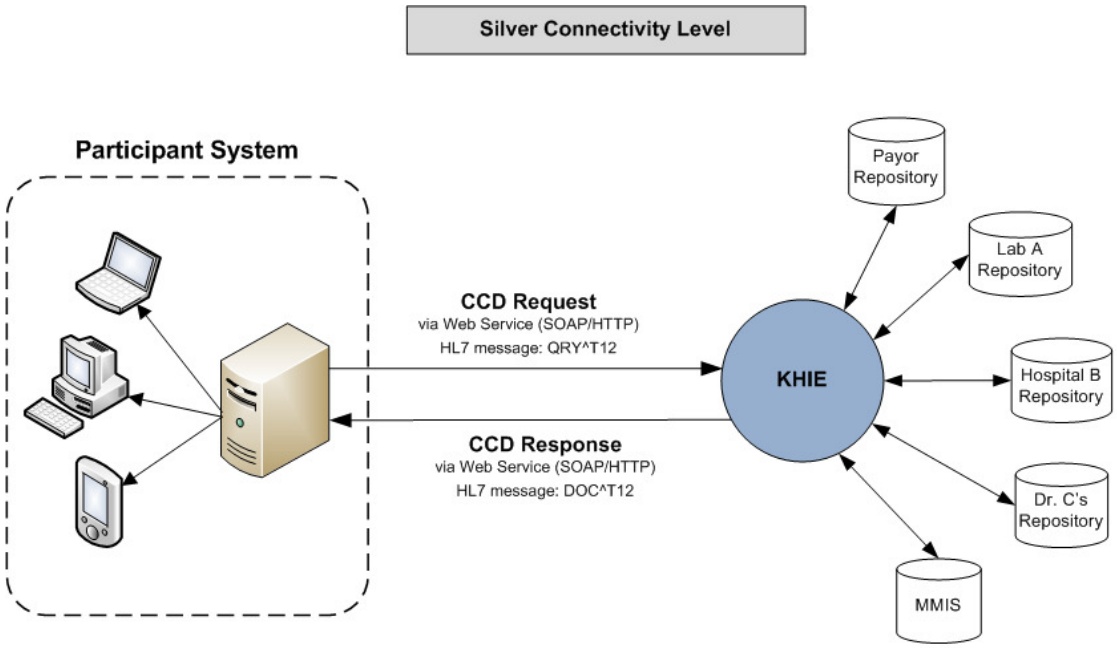
Functional Requirements
Base:

Silver involves being a data consumer via the HIE, with:

- Ability to connect to the KHIE over a secure web service
- Ability to generate an HL7 v2.x QRY^T12 (See section 7.1.3) message and send to the web service, synchronous
- Ability to receive an HL7 DOC^T12 (See section 7.1.4) message from the web service
- Ability to extract a CDA Document (CCD) from the DOC^T12
- Ability to store a CCD Document
- Ability to view a CCD Document in a Viewer

Optional

- Ability to consume components of the CCD (vendor driven)



The "Silver" plan allows participants to request and receive a CCD from KHIE.

Figure 6.1-1

6.2 Gold

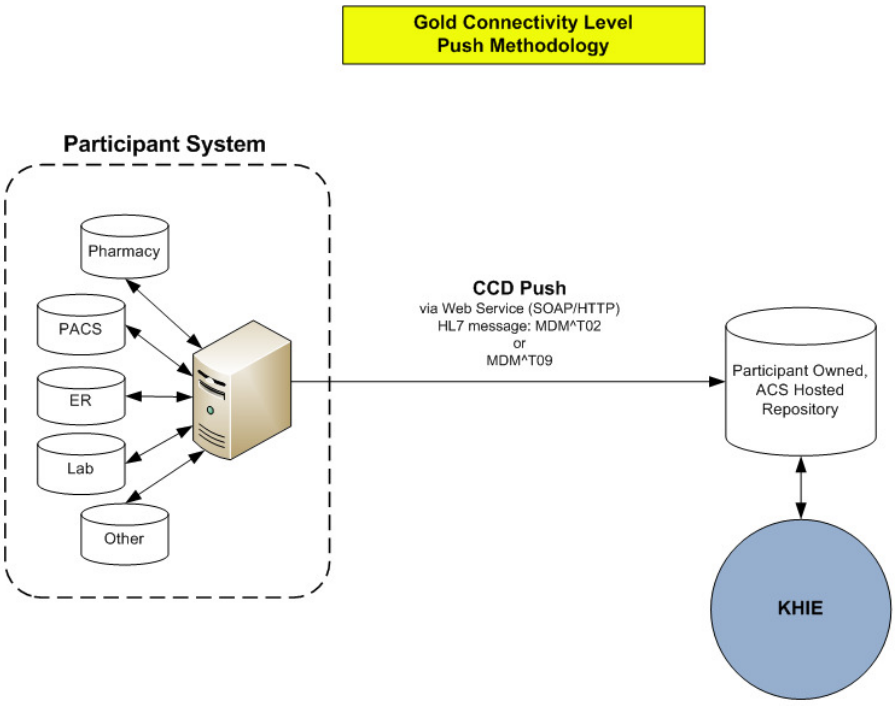
Gold involves being a data provider via the HIE, and there are two ways to do this:

1. Provide a document (Push) with Content via MDM^T02 (See Section 7.1.5) to Participant owned or a hosted repository, as long as the repository can handle the query facility in a way that is compatible with the KHIE as described in this document.

2. The participant can develop the ability to do the reverse of "Silver" where the participant hosts a service that can be queried (Pull) at any time by the KHIE via the QRY^T12 (See Section 7.1.3) and return a DOC^T12 (See Section 7.1.4) from the web service with the same WSDL that was developed for Silver.

Functional Requirements
Push - Base:

- Ability to perform at Silver Level for KHIE Query
- Ability to provide an Encounter CCD to the KHIE following a patient visit (Physician – Clinic)
- Ability to provide a Discharge CCD to the KHIE following a patient discharge (hospital)
- Ability to generate an HL7 v2.x MDM^T02 (Provide Document with Content) (See Section 7.1.5) and MDM^T09 (Replace Document)
- Ability to include a CCD in the MDM message
- KHIE will Register Document in the XDS registry to allow sharing with other providers (internal MDM^T01 or ITI 14 messaging)
- The Participant will provide Repository for approved document types that may be shared among health care providers. This repository is not part of the KHIE.
- KHIE may include information in a consolidated CCD



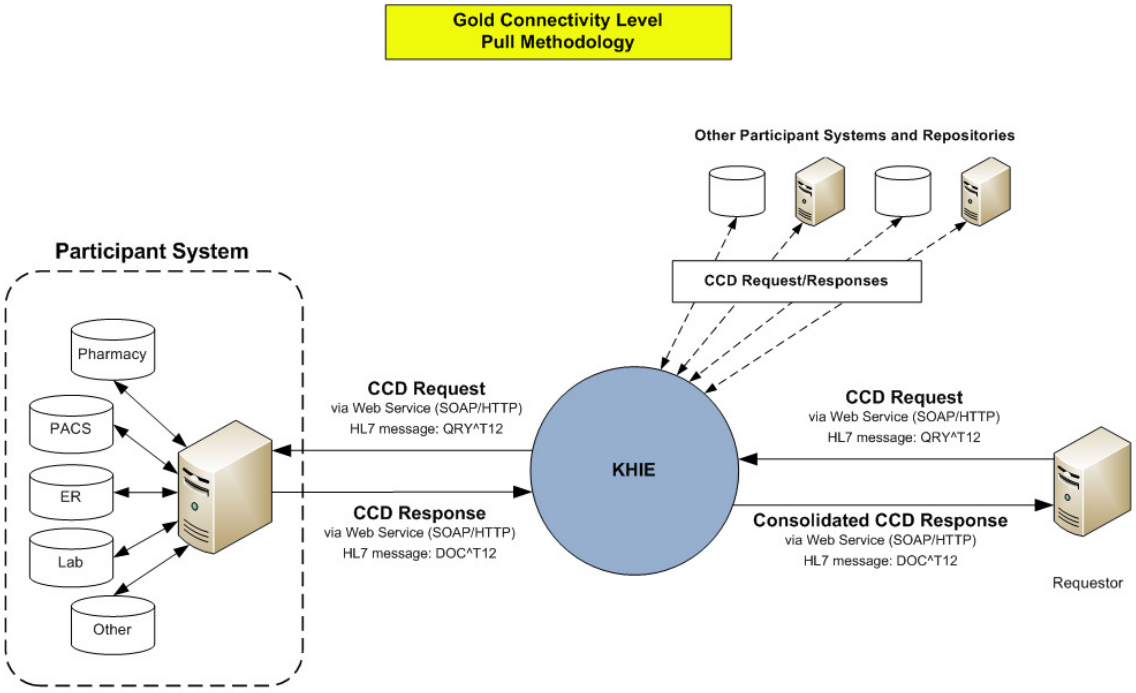
Gold Connectivity Level participants should also be able to perform "Silver" level functions illustrated in diagram *(Figure 6.1-1)* This option is in addition to the "Silver" plan.

Data/CCD Storage Location: participant owned, ACS hosted repository
Data/CCD submitted: when a patient encounter occurs

Figure 6.1-2

Functional Requirements
Pull - Base:

- Ability to connect to the KHIE over a secure web service
- Ability to receive an HL7 v2.x QRY^T12 (See Section 7.1.3) message and send to the web service, synchronous
- Ability to provide an HL7 DOC^T12 (See Section 7.1.4) message from the web service
- Ability to extract a CDA Document (CCD) from the DOC^T12
- Ability to store a CCD Document
- Ability to view a CCD Document in a Viewer



Gold Connectivity Level participants should also be able to perform "Silver" level functions illustrated in diagram *(Figure 6.1-1)* This option is in addition to the "Silver" plan.

Data/CCD Storage Location: participant (stored or built at request time)
Data/CCD retrieved: when another KHIE participant requests CCD

Figure 6.1-3

6.3 Platinum

Platinum involves the ability to exchange a Cross Enterprise Document Sharing (XDS). There will be a separate Participant Connectivity Guide published to address this area.

Functional Requirements
Base:

- Ability to connect to the KHIE over a secure web service
- Ability to utilize the IHE Framework – Cross Enterprise Document Exchange (XDSb) to
  - Register Documents with the KHIE and
  - Retrieve documents through the KHIE
- Ability to maintain a document repository accessible to KHIE or utilize a Vendor hosted repository that is independent from KHIE

Secondary

- Ability to utilize the IHE Framework – Cross Enterprise Document Sharing for Imaging (XDS I.b) to
  - Register Images and AVIs with the KHIE
  - Ability to retrieve images through the KHIE
- Ability to maintain an accessible PACS image repository

NOTE: Optional pricing for Vendor option to host PACS repository is available.

Chapter 7 HL7 Message - Transmission and Response

7.1 Use of HL-7

The KHIE Initiative has implemented a generic interface to the HL7 Standard for use in communicating with external systems to exchange point of care healthcare information. The interface strictly adheres to the HL7 Standard and avoids using "Z" type extensions to the Standard. This message specification is subject to modification and revision to incorporate changes, improvements, and enhancements. This version supports HL7 V 2.4 and 2.5.1 Standard.

KHIE overall, utilizes five primary messages specified by HL7.

- Patient Administration (ADT)
- Orders (ORM)
- Results (ORU and OUL)
- Medical Records (MDM)
- Query (QRY)

Within each category specific message types have been implemented to exchange information. Complete specifications for supported message pairs are contained within this document.

This manual discusses the use of a structured HL7 Query Message to Request and Receive a Continuity of Care Document (PULL). The manual also addresses the MDM message to provide a CCD (PUSH) to the participant on the participant's document repository.

Readers are referred to the HL7 Global Messaging Standard Chapter 7 Medical Record/ Information Management and Chapter 5 Query for additional information.

Following the release of this guide, there will be a specification review discussion to address the detailed data map with the participants.

Note: All values for various tables are not shown, only those utilized by KHIE. For a complete list of all values in each HL7 table, please refer to HL7 Standards.

7.1 Overview

HL-7 provides a standard version 2.X Query - Response pair to request documents even though the published document may utilized HL-7 CDAr2 Architecture. This situation exists with the CCD. Because the CCD is generated on demand, the Query Message (QRY) and the T12 event method is utilized to request a CCD and the document is returned in the Response known as the DOC^T12. The specifications listed below are not intended to specify all components of a message but rather to specify specific use of particular components. It is assumed participants have familiarity with HL7 standards and understand the use of common components.

7.1.1 General Conformance Summary

Table 7.1.1-1

Query Statement ID (Query ID=):	QRY^T12
Type:	Query
Query Name:	Document Request
Query Trigger (= MSH-9):	QRY^T12^QRY
Query Mode:	Both
Response Trigger (= MSH-9):	Doc^T12^DOC_T12

Query Statement ID (Query ID=):	QRY^T12
Query Characteristics:	May specify patient and LOINC code of document to be returned.
Purpose:	To retrieve patient summary information from the Server.
Response Characteristics:	Display – CDAr2
Based on Segment Pattern:	Varies by document

7.1.2 Documents - Current

1. Continuity of Care Panel (CCD) - LOINC 48769-4
    a. Response Formats
        i. Display - CDAr2 Format
    b. Decomposition of Components

Table 7.1.2-1

Document LOINC# [1]	Component LOINC#	Property[2]
48769-4		Continuity of Care Panel
	34133-9	Summarization of episode note
	48764-5	Summary purpose
	48768-6	Payment sources
	42348-3	Advanced directives
	47420-5	Functional status assessment
	11450-4	Problem list
	11323-3	General health
	10157-6	History of family member diseases
	29762-2	Social history
	48765-2	Allergies, adverse reactions, alerts
	10160-0	History of medication use
	46264-8	History of medical device use
	11369-6	History of immunization
	8716-3	Physical findings
	30954-2	Relevant diagnostic tests &or laboratory data
	47519-4	History of Procedures
	46240-8	History of hospitalizations and History of outpatient visits (from claims)
	18776-5	Plan of treatment
	33999-4	Status
	48766-0	Information source
	48767-8	Annotation comment

Notes:
1. Regenstrief Coding of the CCD using Logical Observation Identifiers Names and Codes System (LOINC)
2. Section availability based upon available data and source.

7.1.3 Document Query Structure

This HL7 Message shall be used to request a Continuity of Care Document (CCD).

Table 7.1.3-1

QRY^T12^QRY	Document Query
MSH	Message Header
QRD	Query Definition

QRY^T12^QRY	Document Query
QRF	Query Filter

7.1.3.1 MSH - Message Header Segment

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message. Those rows highlighted in grey are optional but not required.

Table 7.1.3.1-1 – HL7 Attribute Table - MSH - Message Header

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	1	ST	R			00001	Field Separator
2	4	ST	R			00002	Encoding Characters
3	180	HD	O		0361	00003	Sending Application
4	180	HD	O		0362	00004	Sending Facility
5	180	HD	O		0361	00005	Receiving Application
6	180	HD	O		0362	00006	Receiving Facility
7	26	TS	R			00007	Date/Time Of Message
8	40	ST	O			00008	Security
9	13	CM	R		0076/ 0003	00009	Message Type
10	20	ST	R			00010	Message Control ID
11	3	PT	R			00011	Processing ID
12	60	VID	R		0104	00012	Version ID
13	15	NM	O			00013	Sequence Number
14	180	ST	O			00014	Continuation Pointer
15	2	ID	O		0155	00015	Accept Acknowledgment Type
16	2	ID	O		0155	00016	Application Acknowledgment Type
17	3	ID	O		0399	00017	Country Code
18	16	ID	O	Y	0211	00692	Character Set
19	250	CE	O			00693	Principal Language Of Message
20	20	ID	O		0356	01317	Alternate Character Set Handling Scheme
21	10	ID	O	Y	0449	01598	Conformance Statement ID

MSH field definitions:

MSH-1 Field separator (ST) 00001

Definition: This field contains the separator between the segment ID and the first real field, *MSH-2-encoding characters*. As such it serves as the separator and defines the character to be used as a separator for the rest of the message. Recommended value is: |, (ASCII 124).

MSH-2 Encoding characters (ST) 00002

Definition: This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. Recommended values are ^~\& (ASCII 94, 126, 92, and 38, respectively).

MSH-3 Sending application (HD) 00003

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
        ID type (ID)>

Sample Message Value:  TBD
```

Definition: This field uniquely identifies the sending application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise. Entirely site-defined. *User-defined Table 0361-Sending/receiving application* is used as the user-defined table of values for the first component.

Table 7.1.3.1-2 – User-defined Table 0361 – Sending/receiving application

Value	Description
TBD	Dependent on values found for Onboarded systems
ACS-EHR	Affiliated Computer Systems Electronic Health Record

MSH-4 Sending facility (HD) 00004

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
         ID type (ID)>
```

Definition: This field further describes the sending application, *MSH-3-sending application*. With the promotion of this field to an HD data type, the usage has been broadened to include not just the sending facility but other organizational entities such as a) the organizational entity responsible for sending application; b) the responsible unit; c) a product or vendor's identifier, etc. Entirely site-defined. *User-defined Table 0362 – Sending/receiving facility* is used as the HL7 identifier for the user-defined table of values for the first component.

The following values apply to data exchanges between outside services and KHIE.

Table 7.1.3.1-3 – User-defined Table 0362 – Sending/receiving facility

Value	Description
ACS	Affiliated Computer Services
TBD	Dependant on values found for Onboarded Providers
NPI	National Provider ID, used to uniquely identify the sender

Provider systems requesting information will utilize MSH4 to send the Provider National Provider Identifier as follows

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
         ID type (ID)>

Use:         <name of registrant> ^ <NPI Number> ^ < Value "L"
         HL7301>

Sample Message Value:  Lunetta^1124067780^L or ^1124067780^L
```

Utilizing a Universal ID Type "L" (Locally Defined) from HL7 Table 301 will allow the NPI to be sent as a component. The KHIE system will validate the NPI against Table 362 which will contain provider information. Additional clinical information held by outside systems will be included in the CCD response for valid providers.

MSH-5 Receiving application (HD) 00005

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
         ID type (ID)>
```

Definition: This field uniquely identifies the receiving application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise. Entirely site-defined. *User-defined Table 0361-Sending/receiving application* is used as the HL7 identifier for the user-defined table of values for the first component.

MSH-6 Receiving facility (HD) 00006

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
         ID type (ID)>
```

```
Sample Message value:  ACS
```

Definition: This field identifies the receiving application among multiple identical instances of the application running on behalf of different organizations. *User-defined Table 0362 – Sending/receiving facility* is used as the HL7 identifier for the user-defined table of values for the first component. Entirely site-defined.

MSH-7 Date/time of message (TS) 00007

Definition: This field contains the date/time that the sending system created the message. If the time zone is specified, it will be used throughout the message as the default time zone.

Note: This field was made required in version 2.4. Messages with versions prior to 2.4 are not required to value this field. This usage supports backward compatibility.

MSH-9 Message type (CM) 00009

```
Components:  <message type (ID)> ^ <trigger event (ID)> ^ <message
         structure (ID)>
```

Definition: This field contains the message type, trigger event, and the message structure ID for the message.

The first component is the message type code defined by *HL7 Table 0076 - Message type*.

This field will contain "QRY"

The second component is the trigger event code defined by *HL7 Table 0003 - Event type*. This table contains values like A01, O01, R01 etc.

This field will contain "T12"

MSH-10 Message control ID (ST) 00010

Definition: This field contains a number or other identifier that uniquely identifies the message. The receiving system echoes this ID back to the sending system in the Message acknowledgment segment (MSA). Hospital systems that may have multiple internal systems may choose to utilize this field for the hospital medical record number or other unique patient identifier.

MSH-11 Processing ID (PT) 00011

```
Components:  <processing ID (ID)> ^ <processing mode (ID)>
```

Definition: This field is used to decide whether to process the message as defined in HL7 Application (level 7) Processing rules. The first component defines whether the message is part of a production, training, or debugging system (refer to *HL7 Table 0103 - Processing ID* for valid values). The second component defines whether the message is part of an archival process or an initial load (refer to *HL7 Table 0207 - Processing mode* for valid values). This allows different priorities to be given to different processing modes.

Table 7.1.3.1-4 – HL7 Table 0103 - Processing ID

Value	Description
P	Production

Training and Testing will be conducted in an environment separate from production.

MSH-12 Version ID (VID) 00012

```
Components:  <version ID (ID)> ^ <internationalization code (CE)> ^
         <internal version ID (CE)>
```

Definition: This field is matched by the receiving system to its own version to be sure the message will be interpreted correctly. Beginning with Version 2.3.1, it has two additional "internationalization" components, for use by HL7 international affiliates. The <internationalization code> is CE data type (using the ISO country codes where appropriate) which represents the HL7 affiliate. The <internal version ID> is used if the HL7 Affiliate has more than a single 'local'

version associated with a single US version. The <internal version ID> has a CE data type, since the table values vary for each HL7 Affiliate.

Table 7.1.3.1-5 – HL7 Table 0104 - Version ID

Value	Description	Comment (Date)
2.3.1	Release 2.3.1	May 1999
2.4	Release 2.4	November 2000
2.5	Release 2.5	May 2003
2.5.1	Release 2.5.1	January 2007

7.1.3.2 QRD – Original Style Query Definition

Table 7.1.3.2-1 – QRD Segment Field Definitions

SEQ	LEN	DT	OPT	RP/#	HL7 TBL#	ITEM #	ELEMENT NAME
1	26	TS	R			00025	Query Date/Time
2	1	ID	R		0106	00026	Query Format Code
3	1	ID	R		0091	00027	Query Priority
4	10	ST	R			00028	Query ID
5	1	ID	O		0107	00029	Deferred Response Type
6	26	TS	O			00030	Deferred Response Date/Time
7	10	CQ	R		0126	00031	Quantity Limited Request
8	250	XCN	R	Y		00032	Who Subject Filter
9	250	CE	R	Y	0048	00033	What Subject Filter
10	250	CE	R	Y		00034	What Department Data Code
11	20	VR	O	Y		00035	What Data Code Value Qual.
12	1	ID	O		0108	00036	Query Results Level

QRD-1 Query Date/time (TS) 00025

Definition: This field contains the date the query was generated by the application program.

Components: **<Time (DTM)> ^ <DEPRECATED-Degree of Precision (ID)>**

QRD-2 Query Format Code (ID) 00026

Definition: This field refers to HL7 Table 0106 - Query/response format code for valid values.

Table 7.1.3.2-2 – HL7 Table 0106 - Query/response format code

Value	Description	Comment
D	Response is in display format	CDAr2 formatted – Human Readable – use for CCD

QRD-3 Query Priority (ID) 00027

Definition: This field contains the time frame in which the response is expected. Refer *HL7 Table 0091 - Query priority* for valid values. Table values and subsequent fields specify time frames for response.

Table 7.1.3.2-3 – HL7 Table 0091 - Query priority

Value	Description	Comment
I	Immediate	Always Use for this segment

QRD-4 Query ID (ST) 00028

Definition: This field contains a unique identifier for the query. Assigned by the querying application. Returned intact by the responding application. Each Provider EMR will generate its own identifier when requesting a CCD.

QRD-7 Quantity Limited Request (CQ) 00031

Definition: This field contains the maximum length of the response that can be accepted by the requesting system. Valid responses are numerical values (in the first component) given in the units specified in the second component. Refer to *HL7 Table 0126 - Quantity limited request* for valid entries for the second component. Default is LI (lines).

```
Components:  <Quantity (NM)> ^ <Units (CE)>

Subcomponents for Units (CE):  <Identifier (ST)> & <Text (ST)> &
         <Name of Coding System (ID)> & <Alternate Identifier (ST)>
         & <Alternate Text (ST)> & <Name of Alternate Coding System
         (ID)>

Sample Message Value: 1^ZO&Locally Define&HL70126 (minimum requirement 1^ZO)
```

Table 7.1.3.2-4 – HL7 Table 0126 - Quantity limited request

Value	Description	Comment
ZO	Locally defined	Use with Display Response

QRD-8 Who Subject Filter (XCN) 00032

Definition: This field identifies the subject, or who the inquiry is about.

```
Components:  <ID Number (ST)> ^ <Family Name (FN)> ^ <Given Name
         (ST)> ^ <Second and Further Given Names or Initials Thereof
         (ST)> ^ <Suffix (e.g., JR or III) (ST)> ^ <Prefix (e.g.,
         DR) (ST)> ^ <DEPRECATED-Degree (e.g., MD) (IS)> ^ <Source
         Table (IS)> ^ <Assigning Authority (HD)> ^ <Name Type Code
         (ID)> ^ <Identifier Check Digit (ST)> ^ <Check Digit Scheme
         (ID)> ^ <Identifier Type Code (ID)> ^ <Assigning Facility
         (HD)> ^ <Name Representation Code (ID)> ^ <Name Context
         (CE)> ^ <DEPRECATED-Name Validity Range (DR)> ^ <Name
         Assembly Order (ID)> ^ <Effective Date (TS)> ^ <Expiration
         Date (TS)> ^ <Professional Suffix (ST)> ^ <Assigning
         Jurisdiction (CWE)> ^ <Assigning Agency or Department
         (CWE)>

Subcomponents for Family Name (FN):  <Surname (ST)> & <Own Surname
         Prefix (ST)> & <Own Surname (ST)> & <Surname Prefix From
         Partner/Spouse (ST)> & <Surname From Partner/Spouse (ST)>

Subcomponents for Assigning Authority (HD):  <Namespace ID (IS)> &
         <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Assigning Facility (HD):  <Namespace ID (IS)> &
         <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Name Context (CE):  <Identifier (ST)> & <Text
         (ST)> & <Name of Coding System (ID)> & <Alternate
         Identifier (ST)> & <Alternate Text (ST)> & <Name of
         Alternate Coding System (ID)>

Subcomponents for DEPRECATED-Name Validity Range (DR):  <Range Start
         Date/Time (TS)> & <Range End Date/Time (TS)>

         Note subcomponent contains sub-subcomponents
```

Subcomponents for Effective Date (TS): <Time (DTM)> & <DEPRECATED-Degree of Precision (ID)>

Subcomponents for Expiration Date (TS): <Time (DTM)> & <DEPRECATED-Degree of Precision (ID)>

Subcomponents for Assigning Jurisdiction (CWE): <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)> & <Coding System Version ID (ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

Subcomponents for Assigning Agency or Department (CWE): <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)> & <Coding System Version ID (ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

QRD-9 What Subject Filter (CE) 00033

Definition: This field describes the kind of information that is required to satisfy the request. Valid values define the type of transaction inquiry and may be extended locally during implementation.

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)>

Table 7.1.3.2-5 – HL7 Table 0048 - What subject filter

Value	Description	Comment
OTH	Other	Use Other for CCD. LOINC code to be delivered in QRD10

QRD-10 What Department Data Code (CE) 00034

Definition: This field contains the possible contents including test number, procedure number, drug code, item number, order number, etc. The contents of this field are determined by the contents of the previous field. This field could contain multiple occurrences separated by repetition delimiters. The LOINC Code for the Continuity of Care Document shall be used here.

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)>

Sample Message Value: 48769-4^Continuity of Care Panel^LN**^CCD**

QRD-12 Query Results Level (ID) 00036

Definition: This field is used to control level of detail in results. Refer to *HL7 Table 0108 - Query results level* for valid values. See HL 7 chapters 4 and 7.

Table 7.1.3.2-6 – HL7 Table 0108 - Query results level

Value	Description	Comment
T	Full results	Request Full Results

7.1.3.3 QRF - original style query filter segment

The QRF segment is used with the QRD segment to further refine the content of an original style query.

QRF5 components may be used to further define the patient.

Table 7.1.3.3-1 – HL7 Attribute Table – QRF – Original style query filter

SEQ	LEN	DT	OPT	RP/#	HL7 TBL#	ITEM #	ELEMENT NAME
1	20	ST	R	Y		00037	Where Subject Filter
2	26	TS	B			00038	When Data Start Date/Time
3	26	TS	B			00039	When Data End Date/Time
4	60	ST	O	Y		00040	What User Qualifier
5	60	ST	O	Y		00041	Other QRY Subject Filter
6	12	ID	O	Y	0156	00042	Which Date/Time Qualifier
7	12	ID	O	Y	0157	00043	Which Date/Time Status Qualifier
8	12	ID	O	Y	0158	00044	Date/Time Selection Qualifier
9	60	TQ	O			00694	When Quantity/Timing Qualifier
10	10	NM	O			01442	Search Confidence Threshold

QRF field definitions

QRF-1 Where Subject Filter (ST) 00037

Definition: This field identifies the department, system, or subsystem to which the query pertains. This field may repeat as in LAB~HEMO, etc., where the subject filter shall use *HL7 Table 0361* Value Field Only. For EMR System requests the value of KHIE shall be used.

```
Sample Message Value:  BSBS\R\TBD
```

QRF-5 Other QRY Subject Filter (ST) 00041

Definition: This field contains a filter defined locally for use between two systems. This filter uses codes and field definitions that have specific meaning only to the applications and/or site involved.

These keys are transmitted as strings separated by repeat delimiters. The position of the components within *QRF-5-other QRY subject filter* is significant. The requester sends values for all the components that are known."

```
Components:  <patient social security number> ~ <patient birth date>
        ~ <patient birth state> ~ <patient birth registration
        number> ~ <patient medicaid number> ~ <mother's name
        last^first^middle> ~ <mother's maiden name> ~ <mother's
        Social Security number> ~ <father's name last^first^middle>
        ~ <father's Social Security number>
```

Note: Patient SSN, Birth date or Medicaid ID Number may be transmitted in this additional data element to supplement QRD8 - Who Subject Filter.

Table 7.1.3.3-2 – QRF 5 – Components

Pos	Component	Data Type	Description/Examples
1	Patient Social Security Number~	ST	In U.S., use SSN, without hyphens between 3rd and 4th digits and 5th and 6th digits, e.g., 123456789. In other countries, universal patient ID such as National Health Service number may be used.
2	Patient Birth Date~	DT	July 4, 1976 = 19760704
3	Patient Birth State~	ID	In U.S., use 2-letter postal code, e.g., IN, NY, CA. In other countries, locally applicable postal table may be used.

4	Patient Birth Registration Number~	ST	State birth certificate number
5	Patient Medicaid Number~	ST	When relevant
6	Mother's Name Last^First^Middle~	PN	<family name> ^ <given name> ^ <middle name or initial> ^ <suffix> ^ <prefix> ^ <degree>. E.g., Smith^Mary^Elizabeth
7	Mother's Maiden Name~	ST	Family name of mother before marriage. E.g., Jones
8	Mother's Social Security Number~	ST	In U.S., use SSN, without hyphens between 3rd and 4th digits and 5th and 6th digits, e.g., 123456789. In other countries, universal patient ID such as National Health Service number may be used.
9	Father's Name Last^First^Middle~	PN	<family name> ^ <given name> ^ <middle name or initial> ^ <suffix> ^ <prefix> ^ <degree>. E.g.,Smith^Thomas^A^Jr
10	Father's Social Security Number	ST	In U.S., use SSN, without hyphens between 3rd and 4th digits and 5th and 6th digits, e.g., 123456789. In other countries, universal patient ID such as National Health Service number may be used.

QRF-9 When Quantity/timing Qualifier (TQ) 00694

Definition: This field allows an interval definition to be used for specifying multiple responses to a query. With the addition of this filter, new query specifications should no longer use *QRF-2-When data start date/time* and *QRF-3-When data end date/time* in future implementations.

```
Components:  <Quantity (CQ)> ^ <Interval (RI)> ^ <Duration (ST)> ^
         <Start Date/Time (TS)> ^ <End Date/Time (TS)> ^ <Priority
         (ST)> ^ <Condition (ST)> ^ <Text (TX)> ^ <Conjunction (ID)>
         ^ <Order Sequencing (OSD)> ^ <Occurrence Duration (CE)> ^
         <Total Occurrences (NM)>

Subcomponents for Quantity (CQ):  <Quantity (NM)> & <Units (CE)>

         Note subcomponent contains sub-subcomponents

Subcomponents for Interval (RI):  <Repeat Pattern (IS)> & <Explicit
         Time Interval (ST)>

Subcomponents for Start Date/Time (TS):  <Time (DTM)> & <DEPRECATED-
         Degree of Precision (ID)>

Subcomponents for End Date/Time (TS):  <Time (DTM)> & <DEPRECATED-
         Degree of Precision (ID)>

Subcomponents for Order Sequencing (OSD):  <Sequence/Results Flag
         (ID)> & <Placer Order Number: Entity Identifier (ST)> &
         <Placer Order Number: Namespace ID (IS)> & <Filler Order
         Number: Entity Identifier (ST)> & <Filler Order Number:
         Namespace ID (IS)> & <Sequence Condition Value (ST)> &
         <Maximum Number of Repeats (NM)> & <Placer Order Number:
         Universal ID (ST)> & <Placer Order Number: Universal ID
         Type (ID)> & <Filler Order Number: Universal ID (ST)> &
         <Filler Order Number: Universal ID Type (ID)>

Subcomponents for Occurrence Duration (CE):  <Identifier (ST)> &
         <Text (ST)> & <Name of Coding System (ID)> & <Alternate
         Identifier (ST)> & <Alternate Text (ST)> & <Name of
         Alternate Coding System (ID)
```

7.1.3.4 Sample Message

MSH|^~\&|TBD|Lunetta^1124067780^L |TBD|ACS|20071220105623||QRY^T12|MSG001|P|2.4
QRD|20080108110417|D|I||||1^ZO|012345678^DOE^JANE^M|OTH|48769-4^Continuity of Care Panel^LN^CCD||T

QRF|BSBS\R\TBD||||123456789\R\19540114||||^^^20081101000000^20080108093531

7.1.4 Document Query Response

This HL7 Message will return the CCD to the requesting System. Since the QRY^T12 message does not include an ACK response, the acknowledgement is included as part of the DOC^T12 response. In addition, a PID segment will be returned with Patient Information to provide additional identification data points for the receiving system. The Patient Visit segment is not used but included as defined by the HL7 Standard.

Table 7.1.4-1

DOC^T12^DOC_T12	Document Response
MSH	Message Header
MSA	Message Acknowledgement
[ERR]	Error
[QAK]	Query Acknowledgement
QRD	Query Definition
{	
[EVN]	Event Type
PID	Patient Identification
PV1	Patient Visit
TXA	Document Notification
[{OBX}]	Observation
}	
[DSC]	Continuation Pointer

7.1.4.1 MSH - Message Header Segment

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message.

Table 7.1.4.1-1 – HL7 Attribute Table - MSH - Message Header

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	1	ST	R			00001	Field Separator
2	4	ST	R			00002	Encoding Characters
3	180	HD	O		0361	00003	Sending Application
4	180	HD	O		0362	00004	Sending Facility
5	180	HD	O		0361	00005	Receiving Application
6	180	HD	O		0362	00006	Receiving Facility
7	26	TS	R			00007	Date/Time Of Message
8	40	ST	O			00008	Security
9	13	CM	R		0076/ 0003	00009	Message Type
10	20	ST	R			00010	Message Control ID
11	3	PT	R			00011	Processing ID
12	60	VID	R		0104	00012	Version ID
13	15	NM	O			00013	Sequence Number
14	180	ST	O			00014	Continuation Pointer
15	2	ID	O		0155	00015	Accept Acknowledgment Type
16	2	ID	O		0155	00016	Application Acknowledgment Type

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
17	3	ID	O		0399	00017	Country Code
18	16	ID	O	Y	0211	00692	Character Set
19	250	CE	O			00693	Principal Language Of Message
20	20	ID	O		0356	01317	Alternate Character Set Handling Scheme
21	10	ID	O	Y	0449	01598	Conformance Statement ID

MSH field definitions

MSH-1 Field separator (ST) 00001

Definition: This field contains the separator between the segment ID and the first real field, *MSH-2-encoding characters*. As such it serves as the separator and defines the character to be used as a separator for the rest of the message. Recommended value is: |, (ASCII 124).

MSH-2 Encoding characters (ST) 00002

Definition: This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. Recommended values are **^~\&** (ASCII 94, 126, 92, and 38, respectively).

MSH-3 Sending application (HD) 00003

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
        ID type (ID)>
```

Definition: This field uniquely identifies the sending application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise. Entirely site-defined. *User-defined Table 0361-Sending/receiving application* is used as the user-defined table of values for the first component.

Table 7.1.4.1-2 – User-defined Table 0361 – Sending/receiving application

Value	Description
TBD	Dependant on values found on Onboarded Partners
ACS-EHR	Affiliated Computer Systems Electronic Health Record

MSH-4 Sending facility (HD) 00004

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
        ID type (ID)>

Sample Message Value:  ACS
```

Definition: This field further describes the sending application, *MSH-3-sending application*. With the promotion of this field to an HD data type, the usage has been broadened to include not just the sending facility but other organizational entities such as a) the organizational entity responsible for sending application; b) the responsible unit; c) a product or vendor's identifier, etc. Entirely site-defined. *User-defined Table 0362 – Sending/receiving facility* is used as the HL7 identifier for the user-defined table of values for the first component.

Table 7.1.4.1-3 – User-defined Table 0362 – Sending/receiving facility

Value	Description
ACS	Affiliated Computer Services
TBD	Dependant on values found on Onboarded Partners

MSH-5 Receiving application (HD) 00005

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
         ID type (ID)>
```

Definition: This field uniquely identifies the receiving application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise. Entirely site-defined. *User-defined Table 0361-Sending/receiving application* is used as the HL7 identifier for the user-defined table of values for the first component.

MSH-6 Receiving facility (HD) 00006

```
Components:  <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal
         ID type (ID)>

Sample Message Value: ACS
```

Definition: This field identifies the receiving application among multiple identical instances of the application running on behalf of different organizations. *User-defined Table 0362 – Sending/receiving facility* is used as the HL7 identifier for the user-defined table of values for the first component. Entirely site-defined.

MSH-7 Date/time of message (TS) 00007

Definition: This field contains the date/time that the sending system created the message. If the time zone is specified, it will be used throughout the message as the default time zone.

Note: This field was made required in version 2.4. Messages with versions prior to 2.4 are not required to value this field. This usage supports backward compatibility.

MSH-9 Message type (CM) 00009

```
Components:  <message type (ID)> ^ <trigger event (ID)> ^ <message
         structure (ID)>
```

Definition: This field contains the message type, trigger event, and the message structure ID for the message.

The first component is the message type code defined by *HL7 Table 0076 - Message type*. This table contains values such as ACK, ADT, ORM, ORU etc.

This field will contain "DOC"

The second component is the trigger event code defined by *HL7 Table 0003 - Event type*. This table contains values like A01, O01, R01 etc.

This field will contain "T12"

MSH-10 Message control ID (ST) 00010

Definition: This field contains a number or other identifier that uniquely identifies the message. The receiving system echoes this ID back to the sending system in the Message acknowledgment segment (MSA).

MSH-11 Processing ID (PT) 00011

```
Components:  <processing ID (ID)> ^ <processing mode (ID)>
```

Definition: This field is used to decide whether to process the message as defined in HL7 Application (level 7) Processing rules. The first component defines whether the message is part of a production, training, or debugging system (refer to *HL7 Table 0103 - Processing ID* for valid values). The second component defines whether the message is part of an archival process or an initial load (refer to *HL7 Table 0207 - Processing mode* for valid values). This allows different priorities to be given to different processing modes.

Table 7.1.4.1-4 – HL7 Table 0103 - Processing ID

Value	Description
P	Production

MSH-12 Version ID (VID) 00012

```
Components:  <version ID (ID)> ^ <internationalization code (CE)> ^
          <internal version ID (CE)>
```

Definition: This field is matched by the receiving system to its own version to be sure the message will be interpreted correctly. Beginning with Version 2.3.1, it has two additional "internationalization" components, for use by HL7 international affiliates. The <internationalization code> is CE data type (using the ISO country codes where appropriate) which represents the HL7 affiliate. The <internal version ID> is used if the HL7 Affiliate has more than a single 'local' version associated with a single US version. The <internal version ID> has a CE data type, since the table values vary for each HL7 Affiliate.

Table 7.1.4.1-5 – HL7 Table 0104 - Version ID

Value	Description	Comment (Date)
2.3.1	Release 2.3.1	May 1999
2.4	Release 2.4	November 2000
2.5	Release 2.5	May 2003
2.5.1	Release 2.5.1	January 2007

7.1.4.2 MSA - Message Acknowledgment Segment

The MSA segment contains information sent while acknowledging another message. The use of the MSA is to return the Message Control ID issued by the requesting system.

Table 7.1.4.2-1 – HL7 Attribute Table - MSA - Message Acknowledgment

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	2	ID	R		0008	00018	Acknowledgment Code
2	20	ST	R			00010	Message Control ID
3	80	ST	B			00020	Text Message
4	15	NM	O			00021	Expected Sequence Number
5			W			00022	Delayed Acknowledgment Type
6	250	CE	B		0357	00023	Error Condition

MSA field definitions

MSA-1 Acknowledgment Code (ID) 00018

Definition: This field contains an acknowledgment code, see message processing rules. Refer to *HL7 Table 0008 - Acknowledgment code* for valid values.

Table 7.1.4.2-2 – HL7 Table 0008 - Acknowledgment code

Value	Description	Comment
AA	Original mode: Application Accept - Enhanced mode: Application acknowledgment: Accept	
AE	Original mode: Application Error - Enhanced mode: Application acknowledgment: Error	
AR	Original mode: Application Reject - Enhanced mode: Application acknowledgment: Reject	

MSA-2 Message Control ID (ST) 00010

Definition: This field contains the message control ID of the message sent by the sending system. It allows the sending system to associate this response with the message for which it is intended. The message control ID is sent in position 10 of the QRY^T12 Message Header.

7.1.4.3 ERR - error segment

The ERR segment is used to add error comments to acknowledgment messages.

Table 7.1.4.3-1 – HL7 Attribute Table - ERR –Error

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	80	CM	R	Y		00024	Error Code and Location

ERR field definition

ERR-1 Error code and location (CM) 00024

```
Components:  <segment ID (ST)> ^ <sequence (NM)> ^ <field position
          (NM)> ^ <code identifying error (CE)>
```

Definition: This field identifies an erroneous segment in another message. The second component is an index if there is more than one segment of type <segment ID>. For systems that do not use the HL7 Encoding Rules, the data item number may be used for the third component. The fourth component (which references *HL7 Table 0357 - Message error condition codes*, (as a CE data type)) is restricted from having any subcomponents as the subcomponent separator is now the CE's component separator.

Table 7.1.4.3-2 – HL7 Table 0357 - Message error condition codes

Error Condition Code	Error Condition Text	Description/Comment
Success		
0	Message accepted	Success. Optional, as the AA conveys success. Used for systems that must always return a status code.
Errors		
100	Segment sequence error	The message segments were not in the proper order, or required segments are missing.
101	Required field missing	A required field is missing from a segment
102	Data type error	The field contained data of the wrong data type, e.g. an NM field contained "FOO".
103	Table value not found	A field of data type ID or IS was compared against the corresponding table, and no match was found.
Rejection		
200	Unsupported message type	The Message Type is not supported.
201	Unsupported event code	The Event Code is not supported.
202	Unsupported processing id	The Processing ID is not supported.
203	Unsupported version id	The Version ID is not supported.
204	Unknown key identifier	The ID of the patient, order, etc., was not found. Used for transactions *other than* additions, e.g. transfer of a non-existent patient.
205	Duplicate key identifier	The ID of the patient, order, etc., already exists. Used in response to

Error Condition Code	Error Condition Text	Description/Comment
		addition transactions (Admit, New Order, etc.).
206	Application record locked	The transaction could not be performed at the application storage level, e.g. database locked.
207	Application internal error	A catchall for internal errors not explicitly covered by other codes.

Sample ERR-1 segment - **ERR-1|MSH|5555|MSH-3|101**

Sample Error message (the full sample document message is a few pages later):

MSH|^~\&|ACS-EHR|ACS|TESTVENDOR|^1164401121^DNS|20080514||DOC^T12|38d7853a-ac3f-4407-8837-f6766b6ce574|P|2.4|
MSA|AE|38d7853a-ac3f-4407-8837-f6766b6ce574|
ERR|Could not create a valid CCD because of no data for this patient |
QRD|20091208|D|I|0|||^ZO|^^^|OTH|48769-4^Continuity of Care panel^LN^CCD|PID||345678912|PATIENT||^|
PV1|1|N|
TXA|1|HP|||||||||ACS.CYBERACCESS|DB734647-FC99-424C-A864-7E3CDA82E703|||||AU|

7.1.4.4 QRD Segment

The QRD Segment should repeat the information contained in the QRY^T12. See QRD Segment above.

7.1.4.5 PID - Patient Identification Segment

Table 7.1.4.5-1

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00104	Set ID - PID
2	20	CX	B			00105	Patient ID
3	250	CX	R	Y		00106	Patient Identifier List
4	20	CX	B	Y		00107	Alternate Patient ID - PID
5	250	XPN	R	Y		00108	Patient Name
6	250	XPN	O	Y		00109	Mother's Maiden Name
7	26	TS	O			00110	Date/Time of Birth
8	1	IS	O		0001	00111	Administrative Sex
9	250	XPN	B	Y		00112	Patient Alias
10	250	CE	O	Y	0005	00113	Race
11	250	XAD	O	Y		00114	Patient Address
12	4	IS	B		0289	00115	County Code
13	250	XTN	O	Y		00116	Phone Number - Home
14	250	XTN	O	Y		00117	Phone Number - Business
15	250	CE	O		0296	00118	Primary Language
16	250	CE	O		0002	00119	Marital Status
17	250	CE	O		0006	00120	Religion
18	250	CX	O			00121	Patient Account Number
19	16	ST	B			00122	SSN Number - Patient

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
20	25	DLN	B			00123	Driver's License Number - Patient
21	250	CX	O	Y		00124	Mother's Identifier
22	250	CE	O	Y	0189	00125	Ethnic Group
23	250	ST	O			00126	Birth Place
24	1	ID	O		0136	00127	Multiple Birth Indicator
25	2	NM	O			00128	Birth Order
26	250	CE	O	Y	0171	00129	Citizenship
27	250	CE	O		0172	00130	Veterans Military Status
28	250	CE	B		0212	00739	Nationality
29	26	TS	O			00740	Patient Death Date and Time
30	1	ID	O		0136	00741	Patient Death Indicator
31	1	ID	O		0136	01535	Identity Unknown Indicator
32	20	IS	O	Y	0445	01536	Identity Reliability Code
33	26	TS	O			01537	Last Update Date/Time
34	241	HD	O			01538	Last Update Facility
35	250	CE	C		0446	01539	Species Code
36	250	CE	C		0447	01540	Breed Code
37	80	ST	O			01541	Strain
38	250	CE	O	2	0429	01542	Production Class Code
39	250	CWE	O	Y	0171	01840	Tribal Citizenship

PID field definitions

PID-1 Set ID - PID (SI) 00104

Definition: This field contains the number that identifies this transaction. For the first occurrence of the segment, the sequence number shall be one, for the second occurrence, the sequence number shall be two, etc.

PID-3 Patient Identifier List (CX) 00106

Definition: This field contains the list of identifiers (one or more) used by the healthcare facility to uniquely identify a patient (e.g., medical record number, billing number, birth registry, national unique individual identifier, etc.). In Canada, the Canadian Provincial Healthcare Number should be sent in this field. The arbitrary term of “internal ID” has been removed from the name of this field for clarity.

```
Components:  <ID Number (ST)> ^ <Check Digit (ST)> ^ <Check Digit
         Scheme  (ID)> ^ <Assigning Authority (HD)> ^ <Identifier
         Type Code (ID)> ^ <Assigning Facility (HD)> ^ <Effective
         Date (DT)> ^ <Expiration Date (DT)> ^ <Assigning
         Jurisdiction (CWE)> ^ <Assigning Agency or Department
         (CWE)>

Subcomponents for Assigning Authority (HD):  <Namespace ID (IS)> &
         <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Assigning Facility (HD):  <Namespace ID (IS)> &
         <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Assigning Jurisdiction (CWE):  <Identifier (ST)> &
         <Text (ST)> & <Name of Coding System (ID)> & <Alternate
         Identifier (ST)> & <Alternate Text (ST)> & <Name of
         Alternate Coding System (ID)> & <Coding System Version ID
```

(ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

Subcomponents for Assigning Agency or Department (CWE): <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)> & <Coding System Version ID (ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

PID-5 Patient Name (XPN) 00108

Definition: This field contains the names of the patient, the primary or legal name of the patient is reported first. Therefore, the name type code in this field should be "L - Legal". Refer to *HL7 Table 0200 - Name Type* for valid values. Repetition of this field is allowed for representing the same name in different character sets. Note that "last name prefix" is synonymous to "own family name prefix" of previous versions of HL7, as is "second and further given names or initials thereof" to "middle initial or name". Multiple given names and/or initials are separated by spaces.

Components: <Family Name (FN)> ^ <Given Name (ST)> ^ <Second and Further Given Names or Initials Thereof (ST)> ^ <Suffix (e.g., JR or III) (ST)> ^ <Prefix (e.g., DR) (ST)> ^ <Degree (e.g., MD) (IS)> ^ <Name Type Code (ID)> ^ <Name Representation Code (ID)> ^ <Name Context (CE)> ^ <Name Validity Range (DR)> ^ <Name Assembly Order (ID)> ^ <Effective Date (TS)> ^ <Expiration Date (TS)> ^ <Professional Suffix (ST)>

Subcomponents for Family Name (FN): <Surname (ST)> & <Own Surname Prefix (ST)> & <Own Surname (ST)> & <Surname Prefix From Partner/Spouse (ST)> & <Surname From Partner/Spouse (ST)>

Subcomponents for Name Context (CE): <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)>

Subcomponents for Name Validity Range (DR): <Range Start Date/Time (TS)> & <Range End Date/Time (TS)>

Subcomponents for Range Start Date/Time (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Range End Date/Time (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Effective Date (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Expiration Date (TS): <Time (DTM)> & <Degree of Precision (ID)>

Table 7.1.4.5-2 – HL7 Table 0200 – Name Type

Value	Description	Comment
L	Legal Name	Use for DOC^T12

PID-7 Date/Time of Birth (TS) 00110

Components: <Time (DTM)> ^ <Degree of Precision (ID)>

Definition: This field contains the patient's Date of Birth.

PID-8 Administrative Sex (IS) 00111

Definition: This field contains the patient's sex. Refer to *User-defined Table 0001 - Administrative Sex* for suggested values.

Table 7.1.4.5-3 – *User-defined* Table 0001 - Administrative Sex

Value	Description	Comment
F	Female	
M	Male	
U	Unknown	
A	Ambiguous	

PID-11 Patient Address (XAD) 00114

```
Components:  <Street Address (SAD)> ^ <Other Designation (ST)> ^
         <City (ST)> ^ <State or Province (ST)> ^ <Zip or Postal
         Code (ST)> ^ <Country (ID)> ^ <Address Type (ID)> ^ <Other
         Geographic Designation (ST)> ^ <County/Parish Code (IS)> ^
         <Census Tract (IS)> ^ <Address Representation Code (ID)> ^
         <Address Validity Range (DR)> ^ <Effective Date (TS)> ^
         <Expiration Date (TS)>

Subcomponents for Street Address (SAD):  <Street or Mailing Address
         (ST)> & <Street Name (ST)> & <Dwelling Number (ST)>

Subcomponents for Address Validity Range (DR):  <Range Start
         Date/Time (TS)> & <Range End Date/Time (TS)>

Subcomponents for Range Start Date/Time (TS):  <Time (DTM)> &
         <Degree of Precision (ID)>

Subcomponents for Range End Date/Time (TS):  <Time (DTM)> & <Degree
         of Precision (ID)>

Subcomponents for Effective Date (TS):  <Time (DTM)> & <Degree of
         Precision (ID)>

Subcomponents for Expiration Date (TS):  <Time (DTM)> & <Degree of
         Precision (ID)>
```

Definition: This field contains the mailing address of the patient. Address type codes are defined by *HL7 Table 0190 - Address Type*. Multiple addresses for the same person may be sent in the following sequence: The primary mailing address must be sent first in the sequence (for backward compatibility); if the mailing address is not sent, then a repeat delimiter must be sent in the first sequence.

PID-13 Phone Number - Home (XTN) 00116

```
Components:  <Telephone Number (ST)> ^ <Telecommunication Use Code
         (ID)> ^ <Telecommunication Equipment Type (ID)> ^ <Email
         Address (ST)> ^ <Country Code (NM)> ^ <Area/City Code (NM)>
         ^ <Local Number (NM)> ^ <Extension (NM)> ^ <Any Text (ST)>
         ^ <Extension Prefix (ST)> ^ <Speed Dial Code (ST)> ^
         <Unformatted Telephone number  (ST)>
```

Definition: This field contains the patient's personal phone numbers. All personal phone numbers for the patient are sent in the following sequence. The first sequence is considered the primary number (for backward compatibility). If the primary number is not sent, then a repeat delimiter is

sent in the first sequence. Refer to *HL7 Table 0201 - Telecommunication Use Code* and *HL7 Table 0202 - Telecommunication Equipment Type* for valid values.

PID-14 Phone Number - Business (XTN) 00117

```
Components:  <Telephone Number (ST)> ^ <Telecommunication Use Code
          (ID)> ^ <Telecommunication Equipment Type (ID)> ^ <Email
          Address (ST)> ^ <Country Code (NM)> ^ <Area/City Code (NM)>
          ^ <Local Number (NM)> ^ <Extension (NM)> ^ <Any Text (ST)>
          ^ <Extension Prefix (ST)> ^ <Speed Dial Code (ST)> ^
          <Unformatted Telephone number  (ST)>
```

Definition: This field contains the patient's business telephone numbers. All business numbers for the patient are sent in the following sequence. The first sequence is considered the patient's primary business phone number (for backward compatibility). If the primary business phone number is not sent, then a repeat delimiter must be sent in the first sequence. Refer to *HL7 Table 0201 - Telecommunication Use Code* and *HL7 Table 0202 - Telecommunication Equipment Type* for valid values.

PID-29 Patient Death Date and Time (TS) 00740

```
Components:  <Time (DTM)> ^ <Degree of Precision (ID)>
```

Definition: This field contains the date and time at which the patient death occurred.

PID-30 Patient Death Indicator (ID) 00741

Definition: This field indicates whether the patient is deceased. Refer to *HL7 Table 0136 - Yes/no Indicator* for valid values.

Y the patient is deceased

N the patient is not deceased

NOTE: PID-29 and PID-30 are optional and should be sent if the publishing system has been notified of the patient status.

7.1.4.6 Patient Visit Segment

The PV1 segment is used by Registration/Patient Administration applications to communicate information on an account or visit-specific basis. HL7 requires the PV1 message be included in the Doc^T12 response but only as a means to qualify that this message in not related to a Patient Visit. Hence only PV1 and PV2 are required.

Table 7.1.4.6-1 – HL7 Attribute Table – PV1 – Patient Visit

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00131	Set ID - PV1
2	1	IS	R		0004	00132	Patient Class
3	80	PL	O			00133	Assigned Patient Location
4	2	IS	O		0007	00134	Admission Type
5	250	CX	O			00135	Preadmit Number
6	80	PL	O			00136	Prior Patient Location
7	250	XCN	O	Y	0010	00137	Attending Doctor
8	250	XCN	O	Y	0010	00138	Referring Doctor
9	250	XCN	B	Y	0010	00139	Consulting Doctor
10	3	IS	O		0069	00140	Hospital Service
11	80	PL	O			00141	Temporary Location
12	2	IS	O		0087	00142	Preadmit Test Indicator
13	2	IS	O		0092	00143	Re-admission Indicator
14	6	IS	O		0023	00144	Admit Source
15	2	IS	O	Y	0009	00145	Ambulatory Status

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
16	2	IS	O		0099	00146	VIP Indicator
17	250	XCN	O	Y	0010	00147	Admitting Doctor
18	2	IS	O		0018	00148	Patient Type
19	250	CX	O			00149	Visit Number
20	50	FC	O	Y	0064	00150	Financial Class
21	2	IS	O		0032	00151	Charge Price Indicator
22	2	IS	O		0045	00152	Courtesy Code
23	2	IS	O		0046	00153	Credit Rating
24	2	IS	O	Y	0044	00154	Contract Code
25	8	DT	O	Y		00155	Contract Effective Date
26	12	NM	O	Y		00156	Contract Amount
27	3	NM	O	Y		00157	Contract Period
28	2	IS	O		0073	00158	Interest Code
29	4	IS	O		0110	00159	Transfer to Bad Debt Code
30	8	DT	O			00160	Transfer to Bad Debt Date
31	10	IS	O		0021	00161	Bad Debt Agency Code
32	12	NM	O			00162	Bad Debt Transfer Amount
33	12	NM	O			00163	Bad Debt Recovery Amount
34	1	IS	O		0111	00164	Delete Account Indicator
35	8	DT	O			00165	Delete Account Date
36	3	IS	O		0112	00166	Discharge Disposition
37	47	DLD	O		0113	00167	Discharged to Location
38	250	CE	O		0114	00168	Diet Type
39	2	IS	O		0115	00169	Servicing Facility
40	1	IS	B		0116	00170	Bed Status
41	2	IS	O		0117	00171	Account Status
42	80	PL	O			00172	Pending Location
43	80	PL	O			00173	Prior Temporary Location
44	26	TS	O			00174	Admit Date/Time
45	26	TS	O	Y		00175	Discharge Date/Time
46	12	NM	O			00176	Current Patient Balance
47	12	NM	O			00177	Total Charges
48	12	NM	O			00178	Total Adjustments
49	12	NM	O			00179	Total Payments
50	250	CX	O		0203	00180	Alternate Visit ID
51	1	IS	O		0326	01226	Visit Indicator
52	250	XCN	B	Y	0010	01274	Other Healthcare Provider

PV1 field definitions

PV1-1 Set ID - PV1 (SI) 00131

Definition: This field contains the number that identifies this transaction. For the first occurrence of the segment, the sequence number shall be one, for the second occurrence, the sequence number shall be two, etc.

PV1-2 Patient Class (IS) 00132

Definition: This field is used by systems to categorize patients by site. It does not have a consistent industry-wide definition. It is subject to site-specific variations. Refer to *User-defined Table 0004 - Patient Class* for suggested values.

Table 7.1.4.6-2 – User-defined Table 0004 - Patient Class

Value	Description	Comment
N	Not Applicable	Preferred value

"Not Applicable" is used here to indicate the enrolment of a patient in the system and there is no scheduled "visit" or "encounter" associated with this message. Hence the entire PV1 segment is not applicable.

7.1.4.7 TXA - Transcription Document Header Segment

The TXA segment contains information specific to a transcribed document but does not include the text of the document. The message is created as a result of a document status change. This information updates other healthcare systems and allows them to identify reports that are available in the transcription system. By maintaining the TXA message information in these systems, the information is available when constructing queries to the transcription system requesting the full document text.

Table 7.1.4.7-1 – HL7 Attribute Table – TXA – Transcription Document Header

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			00914	Set ID - TXA
2	30	IS	R		0270	00915	Document Type
3	2	ID	R		0191	00916	Document Content Presentation
4	26	TS	R			00917	Activity Date/Time
5	250	XCN	O	Y		00918	Primary Activity Provider Code/Name
6	26	TS	O			00919	Origination Date/Time
7	26	TS	C			00920	Transcription Date/Time
8	26	TS	O	Y		00921	Edit Date/Time
9	250	XCN	O	Y		00922	Originator Code/Name
10	250	XCN	O	Y		00923	Assigned Document Authenticator
11	250	XCN	C	Y		00924	Transcriptionist Code/Name
12	30	EI	R			00925	Unique Document Number
13	30	EI	C			00926	Parent Document Number
14	22	EI	O	Y		00216	Placer Order Number
15	22	EI	O			00217	Filler Order Number
16	30	ST	O			00927	Unique Document File Name
17	2	ID	R		0271	00928	Document Completion Status
18	2	ID	O		0272	00929	Document Confidentiality Status
19	2	ID	O		0273	00930	Document Availability Status
20	2	ID	O		0275	00932	Document Storage Status
21	30	ST	C			00933	Document Change Reason
22	250	PPN	C	Y		00934	Authentication Person, Time Stamp
23	250	XCN	O	Y		00935	Distributed Copies (Code and Name of Recipients)

TXA Field Definitions

TXA-1 Set ID - TXA (SI) 00914

Definition: This field contains a number that uniquely identifies this transaction for the purpose of adding, changing, or deleting the transaction.

TXA-2 Document Type (IS) 00915

Definition: This field identifies the type of document (as defined in the transcription system). Refer to *User-Defined Table 0270 - Document Type* for suggested values. The ACS has added the value OTH – Other to this table's entries.

OTH is a user defined value and should be added to EMR Systems in Table 0270.

Table 7.1.4.7-2 – User-Defined Table 0270 - Document Type

Value	Description	Comment
OTH	Other	Used

TXA-3 Document Content Presentation (ID) 00916

Definition: This is a conditional field which is required whenever the message contains content as presented in one or more OBX segments. This field identifies the method by which this document was obtained or originated. Refer to *HL7 Table 0191 – Type of Referenced Data* for valid values.

Table 7.1.4.7-3 – HL7 Table 0191 - Type Of Referenced Data

Value	Description	Comment
AP	Other application data, typically uninterrupted binary data (HL7 V2.3 and later)	
Multipart	MIME multipart package (CDA per 2.5.2)	

TXA-6 Origination Date/Time (TS) 00919

```
Components:  <Time (DTM)> ^ <DEPRECATED-Degree of Precision (ID)>
```

Definition: This field contains the date and time the document was created (i.e. dictated, recorded, etc.).

TXA-12 Unique Document Number (EI) 00925

```
Components:  <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^
         <Universal ID (ST)> ^ <Universal ID Type (ID)>

Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^
         <universal ID (st)> ^ <universal ID type (ID)>
```

Definition: This field will contain GUID identifier generated by the publishing system.

TXA-14 Placer Order Number (EI) 00216

```
Components:  <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^
         <Universal ID (ST)> ^ <Universal ID Type (ID)>
```

The component descriptions presented here are provided for readability. The implementer should treat the component descriptions in Chapter 2 as the definitive content.

```
Components:  <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^
         <Universal ID (ST)> ^ <Universal ID Type (ID)>

Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^
         <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field is the placer application's order number.

This is a composite field. The first component is a string of characters that identifies an individual order (. i.e. OBR). It is assigned by the placer (ordering application). It identifies an order uniquely among all orders from a particular ordering application. The second through fourth components contain the (filler) assigning authority of the placing application. The (filler) assigning authority is a string of characters that will be uniquely associated with an application. A given institution or group of intercommunicating institutions should establish a unique list of applications that may be potential placers and fillers and assign unique entity identifiers. The components are separated by component delimiters.

TXA-17 Document Completion Status (ID) 00928

Definition: This field identifies the current completion state of the document. This is a required, table-driven field. Refer to *HL7 Table 0271 - Document Completion Status* for valid values.

Table 7.1.4.7-4 – HL7 Table 0271 - Document completion status

Value	Description	Comment
DO	Documented	Use for CCD

TXA-18 Document Confidentiality Status (ID) 00929

Definition: This is an optional field which identifies the degree to which special confidentiality protection should be applied to this information. The assignment of data elements to these categories is left to the discretion of the healthcare organization. Refer to *HL7 Table 0272 - Document Confidentiality Status* for valid values.

Table 7.1.4.7-5 – HL7 Table 0272 - Document Confidentiality Status

Value	Description	Comment
R	Restricted	Used value

7.1.4.8 OBX - Observation Segment Usage

The OBX segment is documented in its entirety in HL7 Manual- Chapter 7. Its usage is specified as it applies to KHIE is documented here for clarity.

Table 7.1.4.8-1 – HL7 Attribute Table - OBX – Observation Segment

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00569	Set ID - OBX
2	2	ID	C		0125	00570	Value Type
3	250	CE	R			00571	Observation Identifier
4	20	ST	C			00572	Observation Sub-ID
5	65536[1]	*	C	Y[2]		00573	Observation Value
6	250	CE	O			00574	Units
7	60	ST	O			00575	References Range
8	5	IS	O	Y/5	0078	00576	Abnormal Flags
9	5	NM	O			00577	Probability
10	2	ID	O	Y	0080	00578	Nature of Abnormal Test
11	1	ID	R		0085	00579	Observation Result Status
12	26	TS	O			00580	Date Last Observation Normal Value
13	20	ST	O			00581	User Defined Access Checks
14	26	TS	O			00582	Date/Time of the Observation
15	250	CE	O			00583	Producer's ID
16	250	XCN	O	Y		00584	Responsible Observer
17	250	CE	O	Y		00936	Observation Method
18	22	EI	O	Y		01479	Equipment Instance Identifier
19	26	TS	O			01480	Date/Time of the Analysis

[1] The length of the observation field is variable, depending upon value type. See *OBX-2 value type*.
[2] May repeat for multipart, single answer results with appropriate data types, e.g., CE, TX, and FT data types.

OBX field definitions

OBX-1 Set ID - OBX (SI) 00569

Definition: This field contains the sequence number.

Although the standard supports multiple OBX segments, for the KHIE, only one will be allowed.

OBX-2 Value Type (ID) 00570

Definition: This field contains the format of the observation value in OBX. It must be valued if *OBX-11-Observ result status* is not valued with an 'X". If the value is CE then the result must be a coded entry. When the value type is TX or FT then the results are bulk text. The valid values for the value type of an observation are listed in *HL7 Table 0125 - Value Type*. Valid value being used for the CCD is ED.

The observation value must be represented according to the format for the data type defined in Chapter 2, Section 2.9, "Data Types." For example, an ED consists of 5 components, separated by component delimiters. Specific Values to be included are specified in OBX-5.

The RP value (reference pointer) must be used if the actual observation value is not sent in OBX but exists somewhere else. For example, if the observation consists of an image (document or medical), the image itself cannot be sent in OBX. The sending system may in that case opt to send a reference pointer. The receiving system can use this reference pointer whenever it needs access to the actual image through other interface standards, e.g., DICOM, or through appropriate data base servers.

Table 7.1.4.8-2 – HL7 Table 0125 - Value type

Value	Description	Comment
ED	Address	

CDA documents are to be exchanged in the OBX segment in any message that can exchange documents (such as MDM, ORU or QRY). Within the OBX segment, the MIME package is encoded as an encapsulated (ED) data type.

OBX-3 Observation Identifier (CE) 00571

```
Components:  <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding
         System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate
         Text (ST)> ^ <Name of Alternate Coding System (ID)>
```

Definition: This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). Example: **48769-4^Continuity of Care Document^LN^CCD**

In most systems the identifier will **point** to a master observation table that will provide other attributes of the observation that may be used by the receiving system to process the observations it receives. A set of message segments for transmitting such master observation tables is described in Chapter 8. The relation of an observation ID to a master observation table is analogous to the relationship between a charge code (in a billing record) and the charge master.

When local codes are used as the first identifier in this field we strongly encourage sending a universal identifier as well to permit receivers to equivalence results from different providers of the same service (e.g., a hospital lab and commercial lab that provides serum potassium to a nursing home). LOINC® is an HL7 approved code system for the Observation identifier. It covers observations and measurements, such as laboratory tests, physical findings, radiology studies, and claims attachments and can be obtained from www.regenstrief.org/loinc/loinc.htm. One possible **universal** identifier is LOINC® codes for laboratory and clinical measurements (see *HL7*

defined Table 0396 and the HL7 www list server) and Appendix X2 of ASTM E1467 for neurophysiology tests.

OBX-5 Observation Value (varies) 00573

Definition: This field contains the value observed by the observation producer. In this case, the CCD is contained in this field. *OBX-2-value type* contains the data type for this field according to which observation value is formatted. .

CCD documents are to be exchanged in the OBX segment. The value of *OBX-2-Value Type* should be set to 'ED'. *OBX-5-Observation Value* contains the MIME package encoded as an encapsulated data type. The components should be valued as follows:

- Set the value of *OBX-5.2-Type of Data* to 'multipart'. (^ may be the correct value)
- Set the value of *OBX-5.3-Data Subtype* to 'x-hl7-cda-level-one' (shall be XML)
- Set the value of *OBX-5.4-Encoding* to 'A'. (Note that a MIME package is not itself Base64-encoded. Rather entities within the MIME package are Base64-encoded. A MIME package is sent as ASCII text. Therefore, the correct value is 'A' not 'Base64'.
- Set the value of *OBX-5.5-Data* to equal the MIME package. Every entity within the MIME package must be Base64-encoded. As stated in Chapter 2, "the data component must be scanned before transmission for HL7 delimiter characters (and other non-printing ASCII or non-ASCII characters such as LineFeed), and any found must be escaped by using the HL7 escape sequences defined in Section 2.7 'Use of escape sequences in text fields'. On the receiving application, the data field must be de-escaped after being parsed". As a result, CR/LF sequences required in the MIME package need to be escaped (i.e., converted to '\X0D0A\') prior to transmission. The content type of the first MIME entity is set to 'application/x-hl7-cda-level-one+xml', and should contain the CCD document itself. Multimedia objects referenced by the CCD document that need to be transmitted within the CCD document are to be placed in successive entities of the MIME package.

OBX-11 Observation Result Status (ID) 00579

Definition: This field contains the observation result status. Refer to *HL7 table 0085 - Observation result status codes interpretation* for valid values. This field reflects the current completion status of the results for one Observation Identifier.

It is a required field. Previous versions of HL7 stated this implicitly by defining a default value of “F.” Code **F** indicates that the result has been verified to be correct and final

Table 7.1.4.8-3 – HL7 Table 0085 - Observation result status codes interpretation

Value	Description	Comment
F	Final results; Can only be changed with a corrected result.	Use with CCD

Sample Message

MSH|^~\&|TBD|ACS|TBD|ACS|20080108110417||DOC^T12|0001|P|2.4
MSA|AA|MSG001
QRD|20080108110417|D|I||||ZO|012345678^DOE^JANE^M|OTH|48769-4^Continuity of Care Panel^LN^CCD||T
PID|1||PatientGUID||JONES^JESSE^^^^^L||19540104|F|||12345 MAIN ST^APT 2B^RICHMOND^VA^23113^CHESTERFIELD||(333)333-3333^PRN^PH^Jane.doe@user.com|(555)555-5555^WPN^PH
PV1|1|N
TXA|1|OTH|Multipart|||20080108130000+0500|||||db734647-fc99-424c-a864-7e3cda82e703|||||DO|R

OBX|1|ED|48769-4^Continuity of Care Panel^LN^CCD||\X0094\multipart\X0094\x-hl7-cda-level-one\X0094\A\X0094\MIME-Version: 1.0\x000D\x000A\Content-Type: multipart/related; boundary="HL7-CDA-boundary"\x000D\x000A\type="text/xml"; start="db734647-fc99-424c-a864-7e3cda82e703"\x000D\x000A\Content-Transfer-Encoding: BASE64\x000D\x000A\--HL7-CDA-boundary\x000D\x000A\Content-Type: text/xml; charset="US-ASCII"\x000D\x000A\Content-ID: <db734647-fc99-424c-a864-7e3cda82e703>\x000D\x000A\PD94bWwgdmVyc2lvbj0iMS4wIj8+PD94bWwtc3R5bGVzaGVldCB0eXBlPSJ0ZXh0L3h0=|||||F

7.1.5 Provide Document with Content Message

The KHIE will provide each partner the opportunity to attain certain levels of communication via the information exchange. (Refer to Chapter 6 for further explanation and diagrams)
There are two methods for the partner to provide data in response to a query.

1. Provide Document with Content to Participant owned repository. ACS will handle the query facility in a way that is compatible with the KHIE.

2. Develop the ability to do the reverse of "Silver" where the participant hosts a service that can be queried at any time by the KHIE via the QRY^T12 DOC^T12 over web service with the same WSDL that was developed for Silver.

This message is used to register and provide a document to the KHIE.

7.1.5.1 MDM/ACK - Original Document Notification and Content (Event T02)

Table 7.1.5.1-1

MDM^T02^MDM_T02	Original Document Notification & Content
MSH	Message Header
[{SFT}]	Software Segment
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[{	--- COMMON_ORDER begin
ORC	Common order segment
[{	--- TIMING begin
TQ1	Timing/Quantity
[{TQ2}]	Timing/Quantity Order Sequence
}]	--- TIMING end
OBR	Observation request segment
[{ NTE }]	Notes and comments about the observation (OBR)
	--- COMMON_ORDER end
TXA	Document Notification
{	
OBX	Observation/Result (one or more required)
[{ NTE }]	Notes and comments about the observation (OBX)
}	

Table 7.1.5.1-2

ACK^T02^ACK	General Acknowledgment
MSH	Message Header
[{ SFT }]	Software Segment
MSA	Message Acknowledgment
[{ ERR }]	Error Information

MSH - Message Header Segment

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message.

Table 7.1.5.1-2 – HL 7 Attribute Table - MSH - Message Header

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	1	ST	R			00001	Field Separator
2	4	ST	R			00002	Encoding Characters
3	227	HD	O		0361	00003	Sending Application
4	227	HD	O		0362	00004	Sending Facility
5	227	HD	O		0361	00005	Receiving Application
6	227	HD	O		0362	00006	Receiving Facility
7	26	TS	R			00007	Date/Time Of Message
8	40	ST	O			00008	Security
9	15	MSG	R			00009	Message Type
10	20	ST	R			00010	Message Control ID
11	3	PT	R			00011	Processing ID
12	60	VID	R			00012	Version ID
13	15	NM	O			00013	Sequence Number
14	180	ST	O			00014	Continuation Pointer
15	2	ID	O		0155	00015	Accept Acknowledgment Type
16	2	ID	O		0155	00016	Application Acknowledgment Type
17	3	ID	O		0399	00017	Country Code
18	16	ID	O	Y	0211	00692	Character Set
19	250	CE	O			00693	Principal Language Of Message
20	20	ID	O		0356	01317	Alternate Character Set Handling Scheme
21	427	EI	O	Y		01598	Message Profile Identifier

MSH field definitions

MSH-1 Field Separator (ST) 00001

Definition: This field contains the separator between the segment ID and the first real field, *MSH-2-encoding characters*. As such it serves as the separator and defines the character to be used as a separator for the rest of the message. Recommended value is |, (ASCII 124)

MSH-2 Encoding Characters (ST) 00002

Definition: This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. Recommended values are ^~\& (ASCII 94, 126, 92, and 38, respectively).

MSH-3 Sending Application (HD) 00003

```
Components:  <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal
          ID Type (ID)>
```

Definition: This field uniquely identifies the sending application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise. Entirely site-defined. *User-defined Table 0361- Application* is used as the user-defined table of values for the first component.

Table 7.1.5.1-3 – User-defined Table 0361 –Application

Value	Description
TBD	Dependent on values found for Onboarded systems
ACS-EHR	Affiliated Computer Systems Electronic Health Record

MSH-4 Sending Facility (HD) 00004

```
Components:  <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal
         ID Type (ID)>
```

Definition: This field further describes the sending application, *MSH-3-sending application*. With the promotion of this field to an HD data type, the usage has been broadened to include not just the sending facility but other organizational entities such as a) the organizational entity responsible for sending application; b) the responsible unit; c) a product or vendor's identifier, etc. Entirely site-defined. *User-defined Table 0362 - Facility* is used as the HL7 identifier for the user-defined table of values for the first component.

Table 7.1.5.1-4 – User-defined Table 0362 –Facility

Value	Description
ACS	Affiliated Computer Services
TBD	Dependant on values found on Onboarded Partners

MSH-5 Receiving Application (HD) 00005

```
Components:  <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal
         ID Type (ID)>
```

Definition: This field uniquely identifies the receiving application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise. Entirely site-defined *User-defined Table 0361- Application* is used as the HL7 identifier for the user-defined table of values for the first component.

MSH-6 Receiving Facility (HD) 00006

```
Components:  <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal
         ID Type (ID)>

Sample Message value:  ACS
```

Definition: This field identifies the receiving application among multiple identical instances of the application running on behalf of different organizations. *User-defined Table 0362 - Facility* is used as the HL7 identifier for the user-defined table of values for the first component. Entirely site-defined

MSH-7 Date/Time of Message (TS) 00007

```
Components:  <Time (DTM)> ^ <DEPRECATED-Degree of Precision (ID)>
```

Definition: This field contains the date/time that the sending system created the message. If the time zone is specified, it will be used throughout the message as the default time zone.

Note: This field was made required in version 2.4. Messages with versions prior to 2.4 are not required to value this field. This usage supports backward compatibility.

MSH-9 Message Type (MSG) 00009

```
Components:  <Message Code (ID)> ^ <Trigger Event (ID)> ^ <Message
         Structure (ID)>
```

Definition: This field contains the message type, trigger event, and the message structure ID for the message.

The first component is the message type code defined by *HL7 Table 0076 - Message type*.

This field will contain "MDM"

The second component is the trigger event code defined by *HL7 Table 0003 - Event type*. This table contains values like A01, O01, R01 etc.

This field will contain "T02"

Refer to *HL7 Table 0354 - Message structure* for valid values for the message structure. This table contains values such as ADT_A01, ORU_R01, SIU_S12, etc.

The receiving system uses this field to recognize the data segments, and possibly, the application to which to route this message. For certain queries, which may have more than a single response event type, the second component may, in the response message, vary to indicate the response event type. See the discussion of the display query variants in chapter 5.

MSH-10 Message Control ID (ST) 00010

Definition: This field contains a number or other identifier that uniquely identifies the message. The receiving system echoes this ID back to the sending system in the Message acknowledgment segment (MSA).

MSH-11 Processing ID (PT) 00011

```
Components:  <Processing ID (ID)> ^ <Processing Mode (ID)>
```

Definition: This field is used to decide whether to process the message as defined in HL7 Application (level 7) Processing rules.

MSH-12 Version ID (VID) 00012

```
Components:  <Version ID (ID)> ^ <Internationalization Code (CE)> ^
         <International Version ID (CE)>

Subcomponents for Internationalization Code (CE):  <Identifier (ST)>
         & <Text (ST)> & <Name of Coding System (ID)> & <Alternate
         Identifier (ST)> & <Alternate Text (ST)> & <Name of
         Alternate Coding System (ID)>

Subcomponents for International Version ID (CE):  <Identifier (ST)>
         & <Text (ST)> & <Name of Coding System (ID)> & <Alternate
         Identifier (ST)> & <Alternate Text (ST)> & <Name of
         Alternate Coding System (ID)>
```

Definition: This field is matched by the receiving system to its own version to be sure the message will be interpreted correctly. Beginning with Version 2.3.1, it has two additional "internationalization" components, for use by HL7 international affiliates. The <internationalization code> is CE data type (using the ISO country codes where appropriate) which represents the HL7 affiliate. The <internal version ID> is used if the HL7 Affiliate has more than a single 'local' version associated with a single US version. The <international version ID> has a CE data type, since the table values vary for each HL7 Affiliate.

Table 7.1.5.1-5 – HL7 Table 0104 - Version ID

Value	Description	Comment (Date)
2.3.1	Release 2.3.1	May 1999
2.4	Release 2.4	November 2000
2.5	Release 2.5	May 2003
2.5.1	Release 2.5.1	January 2007

MSH-15 Accept Acknowledgment Type (ID) 00015

Definition: This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message. Required for enhanced acknowledgment mode. Refer to *HL7 Table 0155 - Accept/application acknowledgment conditions* for valid values.

MSH-21 Message Profile Identifier (EI) 01598

```
Components:  <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^
          <Universal ID (ST)> ^ <Universal ID Type (ID)>
```

Definition: Sites may use this field to assert adherence to, or reference, a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages.

Repetition of this field allows more flexibility in creating and naming message profiles. Using repetition, this field can identify a set of message profiles that the message conforms to. For example, the first repetition could reference a vendor's message profile. The second could reference another compatible provider's profile or a later version of the first vendor profile.

As of v2.5, the HL7 message profile identifiers might be used for conformance claims and/or publish/subscribe systems.

Prior to v2.5, the field was called Conformance Statement ID. For backward compatibility, the Conformance Statement ID can be used here. Examples of the use of Conformance Statements appear in Chapter 5, "Query."

PID - Patient Identification Segment

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.
It should be noted that from V2.4 onwards the demographics of animals can also be sent in the PID segment (see PID-35 to PID-38).

The assigning authority, the fourth component of the patient identifiers, is a HD data type that is uniquely associated with the assigning authority that originally assigned the number. A given institution, or group of intercommunicating institutions, should establish a list of assigning authorities that may be potential assignors of patient identification (and other important identification) numbers. The list will be one of the institution's master dictionary lists. Since third parties (other than the assignors of patient identification numbers) may send or receive HL7 messages containing patient identification numbers, the assigning authority in the patient identification numbers may not be the same as the sending and receiving systems identified in the MSH. The assigning authority must be unique across applications at a given site. This field is required in HL7 implementations that have more than a single Patient Administration application assigning such numbers. The assigning authority and identifier type codes are strongly recommended for all CX data types.

With HL7 V2.3, the nomenclature for the fourth component of the patient identifiers was changed from "assigning facility ID" to "assigning authority". While the identifier may be unique to a given healthcare facility (for example, a medical record assigned by facility A in Hospital XYZ), the identifier might also be assigned at a system level (for example a corporate person index or enterprise number spanning multiple facilities) or by a government entity, for example a nationally assigned unique individual identifier. While a facility is usually an assigning authority, not all assigning authorities are facilities. Therefore, the fourth component is referred to as an assigning authority, but retains backward compatibility using the construct of the HD data type (see the note in chapter 2). Additionally, CX data types support the use of assigning facility (HD) as the sixth component.

Table 7.1.5.1-6 – HL7 Attribute Table – PID – Patient Identification

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00104	Set ID - PID

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
2	20	CX	B			00105	Patient ID
3	250	CX	R	Y		00106	Patient Identifier List
4	20	CX	B	Y		00107	Alternate Patient ID - PID
5	250	XPN	R	Y		00108	Patient Name
6	250	XPN	O	Y		00109	Mother's Maiden Name
7	26	TS	O			00110	Date/Time of Birth
8	1	IS	O		0001	00111	Administrative Sex
9	250	XPN	B	Y		00112	Patient Alias
10	250	CE	O	Y	0005	00113	Race
11	250	XAD	O	Y		00114	Patient Address
12	4	IS	B		0289	00115	County Code
13	250	XTN	O	Y		00116	Phone Number - Home
14	250	XTN	O	Y		00117	Phone Number - Business
15	250	CE	O		0296	00118	Primary Language
16	250	CE	O		0002	00119	Marital Status
17	250	CE	O		0006	00120	Religion
18	250	CX	O			00121	Patient Account Number
19	16	ST	B			00122	SSN Number - Patient
20	25	DLN	B			00123	Driver's License Number - Patient
21	250	CX	O	Y		00124	Mother's Identifier
22	250	CE	O	Y	0189	00125	Ethnic Group
23	250	ST	O			00126	Birth Place
24	1	ID	O		0136	00127	Multiple Birth Indicator
25	2	NM	O			00128	Birth Order
26	250	CE	O	Y	0171	00129	Citizenship
27	250	CE	O		0172	00130	Veterans Military Status
28	250	CE	B		0212	00739	Nationality
29	26	TS	O			00740	Patient Death Date and Time
30	1	ID	O		0136	00741	Patient Death Indicator
31	1	ID	O		0136	01535	Identity Unknown Indicator
32	20	IS	O	Y	0445	01536	Identity Reliability Code
33	26	TS	O			01537	Last Update Date/Time
34	241	HD	O			01538	Last Update Facility
35	250	CE	C		0446	01539	Species Code
36	250	CE	C		0447	01540	Breed Code
37	80	ST	O			01541	Strain
38	250	CE	O	2	0429	01542	Production Class Code
39	250	CWE	O	Y	0171	01840	Tribal Citizenship

PID field definitions

PID-1 Set ID - PID (SI) 00104

Definition: This field contains the number that identifies this transaction. For the first occurrence of the segment, the sequence number shall be one, for the second occurrence, the sequence number shall be two, etc.

PID-3 Patient Identifier List (CX) 00106

```
Components:  <ID Number (ST)> ^ <heck Digit (ST)> ^ <Check Digit
          Scheme  (ID)> ^ <Assigning Authority (HD)> ^ <Identifier
          Type Code (ID)> ^ <Assigning Facility (HD)> ^ <Effective
          Date (DT)> ^ <Expiration Date (DT)> ^ <Assigning
```

Jurisdiction (CWE)> ^ <Assigning Agency or Department (CWE)>

Subcomponents for Assigning Authority (HD): <Namespace ID (IS)> & <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Assigning Facility (HD): <Namespace ID (IS)> & <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Assigning Jurisdiction (CWE): <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)> & <Coding System Version ID (ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

Subcomponents for Assigning Agency or Department (CWE): <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)> & <Coding System Version ID (ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

Definition: This field contains the list of identifiers (one or more) used by the healthcare facility to uniquely identify a patient (e.g., medical record number, billing number, birth registry, national unique individual identifier, etc.). In Canada, the Canadian Provincial Healthcare Number should be sent in this field. The arbitrary term of "internal ID" has been removed from the name of this field for clarity.

PID-5 Patient Name (XPN) 00108

Components: <Family Name (FN)> ^ <Given Name (ST)> ^ <Second and Further Given Names or Initials Thereof (ST)> ^ <Suffix (e.g., JR or III) (ST)> ^ <Prefix (e.g., DR) (ST)> ^ <Degree (e.g., MD) (IS)> ^ <Name Type Code (ID)> ^ <Name Representation Code (ID)> ^ <Name Context (CE)> ^ <Name Validity Range (DR)> ^ <Name Assembly Order (ID)> ^ <Effective Date (TS)> ^ <Expiration Date (TS)> ^ <Professional Suffix (ST)>

Subcomponents for Family Name (FN): <Surname (ST)> & <Own Surname Prefix (ST)> & <Own Surname (ST)> & <Surname Prefix From Partner/Spouse (ST)> & <Surname From Partner/Spouse (ST)>

Subcomponents for Name Context (CE): <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)>

Subcomponents for Name Validity Range (DR): <Range Start Date/Time (TS)> & <Range End Date/Time (TS)>

Subcomponents for Range Start Date/Time (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Range End Date/Time (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Effective Date (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Expiration Date (TS): <Time (DTM)> & <Degree of Precision (ID)>

Definition: This field contains the names of the patient, the primary or legal name of the patient is reported first. Therefore, the name type code in this field should be "L - Legal". Refer to *HL7 Table 0200 - Name Type* for valid values. Repetition of this field is allowed for representing the same name in different character sets. Note that "last name prefix" is synonymous to "own family name prefix" of previous versions of HL7, as is "second and further given names or initials thereof" to "middle initial or name". Multiple given names and/or initials are separated by spaces.

Table 7.1.5.1-7 – HL7 Table 0200 - Name Type

Value	Description	Comment
L	Legal Name	

PID-7 Date/Time of Birth (TS) 00110

```
Components:  <Time (DTM)> ^ <Degree of Precision (ID)>
```

Definition: This field contains the patient's date and time of birth.

PID-8 Administrative Sex (IS) 00111

Definition: This field contains the patient's sex. Refer to *User-defined Table 0001 - Administrative Sex* for suggested values.

Table 7.1.5.1-8 – *User-defined* Table 0001 - Administrative Sex

Value	Description	Comment
F	Female	
M	Male	
U	Unknown	
A	Ambiguous	

PID-11 Patient Address (XAD) 00114

```
Components:  <Street Address (SAD)> ^ <Other Designation (ST)> ^
         <City (ST)> ^ <State or Province (ST)> ^ <Zip or Postal
         Code (ST)> ^ <Country (ID)> ^ <Address Type (ID)> ^ <Other
         Geographic Designation (ST)> ^ <County/Parish Code (IS)> ^
         <Census Tract (IS)> ^ <Address Representation Code (ID)> ^
         <Address Validity Range (DR)> ^ <Effective Date (TS)> ^
         <Expiration Date (TS)>

Subcomponents for Street Address (SAD):  <Street or Mailing Address
         (ST)> & <Street Name (ST)> & <Dwelling Number (ST)>

Subcomponents for Address Validity Range (DR):  <Range Start
         Date/Time (TS)> & <Range End Date/Time (TS)>
```

Subcomponents for Range Start Date/Time (TS): <Time (DTM)> & <Degree of Precision (ID)>

```
Subcomponents for Range End Date/Time (TS):  <Time (DTM)> & <Degree
         of Precision (ID)>

Subcomponents for Effective Date (TS):  <Time (DTM)> & <Degree of
         Precision (ID)>

Subcomponents for Expiration Date (TS):  <Time (DTM)> & <Degree of
         Precision (ID)>
```

Definition: This field contains the mailing address of the patient. Address type codes are defined by *HL7 Table 0190 - Address Type*. Multiple addresses for the same person may be sent in the

following sequence: The primary mailing address must be sent first in the sequence (for backward compatibility); if the mailing address is not sent, then a repeat delimiter must be sent in the first sequence.

PID-13 Phone Number - Home (XTN) 00116

```
Components:  <Telephone Number (ST)> ^ <Telecommunication Use Code
         (ID)> ^ <Telecommunication Equipment Type (ID)> ^ <Email
         Address (ST)> ^ <Country Code (NM)> ^ <Area/City Code (NM)>
         ^ <Local Number (NM)> ^ <Extension (NM)> ^ <Any Text (ST)>
         ^ <Extension Prefix (ST)> ^ <Speed Dial Code (ST)> ^
         <Unformatted Telephone number  (ST)>
```

Definition: This field contains the patient's personal phone numbers. All personal phone numbers for the patient are sent in the following sequence. The first sequence is considered the primary number (for backward compatibility). If the primary number is not sent, then a repeat delimiter is sent in the first sequence. Refer to *HL7 Table 0201 - Telecommunication Use Code* and *HL7 Table 0202 - Telecommunication Equipment Type* for valid values.

PID-14 Phone Number - Business (XTN) 00117

```
Components:  <Telephone Number (ST)> ^ <Telecommunication Use Code
         (ID)> ^ <Telecommunication Equipment Type (ID)> ^ <Email
         Address (ST)> ^ <Country Code (NM)> ^ <Area/City Code (NM)>
         ^ <Local Number (NM)> ^ <Extension (NM)> ^ <Any Text (ST)>
         ^ <Extension Prefix (ST)> ^ <Speed Dial Code (ST)> ^
         <Unformatted Telephone number  (ST)>
```

Definition: This field contains the patient's business telephone numbers. All business numbers for the patient are sent in the following sequence. The first sequence is considered the patient's primary business phone number (for backward compatibility). If the primary business phone number is not sent, then a repeat delimiter must be sent in the first sequence. Refer to *HL7 Table 0201 - Telecommunication Use Code* and *HL7 Table 0202 - Telecommunication Equipment Type* for valid values.

PID-29 Patient Death Date and Time (TS) 00740

```
Components:  <Time (DTM)> ^ <Degree of Precision (ID)>
```

Definition: This field contains the date and time at which the patient death occurred.

PID-30 Patient Death Indicator (ID) 00741

Definition: This field indicates whether the patient is deceased. Refer to *HL7 Table 0136 - Yes/no Indicator* for valid values.

Y the patient is deceased
N the patient is not deceased

PV1 - Patient Visit Segment

The PV1 segment is used by Registration/Patient Administration applications to communicate information on an account or visit-specific basis. The default is to send account level data. To use this segment for visit level data *PV1-51 - Visit Indicator* must be valued to "V". The value of PV-51 affects the level of data being sent on the PV1, PV2, and any other segments that are part of the associated PV1 hierarchy (e.g. ROL, DG1, or OBX).

The facility ID, the optional fourth component of each patient location field, is a HD data type that is uniquely associated with the healthcare facility containing the location. A given institution, or group of intercommunicating institutions, should establish a list of facilities that may be potential assignors of patient locations. The list will be one of the institution's master dictionary lists. Since

third parties other than the assignors of patient locations may send or receive HL7 messages containing patient locations, the facility ID in the patient location may not be the same as that implied by the sending and receiving systems identified in the MSH. The facility ID must be unique across facilities at a given site. This field is required for HL7 implementations that have more than a single healthcare facility with bed locations, since the same <point of care> ^ <room> ^ <bed> combination may exist at more than one facility.

Table 7.1.5.1-9 – HL7 Attribute Table - PV1 - Patient Visit

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00131	Set ID - PV1
2	1	IS	R		0004	00132	Patient Class
3	80	PL	O			00133	Assigned Patient Location
4	2	IS	O		0007	00134	Admission Type
5	250	CX	O			00135	Preadmit Number
6	80	PL	O			00136	Prior Patient Location
7	250	XCN	O	Y	0010	00137	Attending Doctor
8	250	XCN	O	Y	0010	00138	Referring Doctor
9	250	XCN	B	Y	0010	00139	Consulting Doctor
10	3	IS	O		0069	00140	Hospital Service
11	80	PL	O			00141	Temporary Location
12	2	IS	O		0087	00142	Preadmit Test Indicator
13	2	IS	O		0092	00143	Re-admission Indicator
14	6	IS	O		0023	00144	Admit Source
15	2	IS	O	Y	0009	00145	Ambulatory Status
16	2	IS	O		0099	00146	VIP Indicator
17	250	XCN	O	Y	0010	00147	Admitting Doctor
18	2	IS	O		0018	00148	Patient Type
19	250	CX	O			00149	Visit Number
20	50	FC	O	Y	0064	00150	Financial Class
21	2	IS	O		0032	00151	Charge Price Indicator
22	2	IS	O		0045	00152	Courtesy Code
23	2	IS	O		0046	00153	Credit Rating
24	2	IS	O	Y	0044	00154	Contract Code
25	8	DT	O	Y		00155	Contract Effective Date
26	12	NM	O	Y		00156	Contract Amount
27	3	NM	O	Y		00157	Contract Period
28	2	IS	O		0073	00158	Interest Code
29	4	IS	O		0110	00159	Transfer to Bad Debt Code
30	8	DT	O			00160	Transfer to Bad Debt Date
31	10	IS	O		0021	00161	Bad Debt Agency Code
32	12	NM	O			00162	Bad Debt Transfer Amount
33	12	NM	O			00163	Bad Debt Recovery Amount
34	1	IS	O		0111	00164	Delete Account Indicator
35	8	DT	O			00165	Delete Account Date
36	3	IS	O		0112	00166	Discharge Disposition
37	47	DLD	O		0113	00167	Discharged to Location
38	250	CE	O		0114	00168	Diet Type
39	2	IS	O		0115	00169	Servicing Facility
40	1	IS	B		0116	00170	Bed Status
41	2	IS	O		0117	00171	Account Status
42	80	PL	O			00172	Pending Location

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
43	80	PL	O			00173	Prior Temporary Location
44	26	TS	O			00174	Admit Date/Time
45	26	TS	O	Y		00175	Discharge Date/Time
46	12	NM	O			00176	Current Patient Balance
47	12	NM	O			00177	Total Charges
48	12	NM	O			00178	Total Adjustments
49	12	NM	O			00179	Total Payments
50	250	CX	O		0203	00180	Alternate Visit ID
51	1	IS	O		0326	01226	Visit Indicator
52	250	XCN	B	Y	0010	01274	Other Healthcare Provider

PV1 field definitions

PV1-1 Set ID - PV1 (SI) 00131

Definition: This field contains the number that identifies this transaction. For the first occurrence of the segment, the sequence number shall be one, for the second occurrence, the sequence number shall be two, etc.

PV1-2 Patient Class (IS) 00132

Definition: This field is used by systems to categorize patients by site. It does not have a consistent industry-wide definition. It is subject to site-specific variations. Refer to *User-defined Table 0004 - Patient Class* for suggested values.

Table 7.1.5.1-10 – User-defined Table 0004 - Patient Class

Value	Description	Comment
N	Not Applicable	Preferred setting

"Commercial Account" is used by reference labs for specimen processing when the service is billed back to a third party. A registration is processed for the specimen to facilitate the subsequent billing. The identity of the patient may be known or unknown. In either case, for billing and statistical purposes, the patient class is considered a commercial account due to the third party billing responsibility.

"Not Applicable" is used only in cases where the PV1 segment itself is not applicable but is retained in the message definitions for backwards compatibility (for example when a managed care system sends A28, A29, or A31 messages to indicate the enrolment of a patient in the system and there is no scheduled "visit" or "encounter" and hence the entire PV1 segment is not applicable).

TXA - Transcription Document Header Segment

The TXA segment contains information specific to a transcribed document but does not include the text of the document. The message is created as a result of a document status change. This information updates other healthcare systems and allows them to identify reports that are available in the transcription system. By maintaining the TXA message information in these systems, the information is available when constructing queries to the transcription system requesting the full document text.

Table 7.1.5.1-11 – HL7 Attribute Table – TXA – Transcription Document Header

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			00914	Set ID - TXA
2	30	IS	R		0270	00915	Document Type
3	2	ID	C		0191	00916	Document Content Presentation

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
4	26	TS	O			00917	Activity Date/Time
5	250	XCN	C	Y		00918	Primary Activity Provider Code/Name
6	26	TS	O			00919	Origination Date/Time
7	26	TS	C			00920	Transcription Date/Time
8	26	TS	O	Y		00921	Edit Date/Time
9	250	XCN	O	Y		00922	Originator Code/Name
10	250	XCN	O	Y		00923	Assigned Document Authenticator
11	250	XCN	C	Y		00924	Transcriptionist Code/Name
12	30	EI	R			00925	Unique Document Number
13	30	EI	C			00926	Parent Document Number
14	22	EI	O	Y		00216	Placer Order Number
15	22	EI	O			00217	Filler Order Number
16	30	ST	O			00927	Unique Document File Name
17	2	ID	R		0271	00928	Document Completion Status
18	2	ID	O		0272	00929	Document Confidentiality Status
19	2	ID	O		0273	00930	Document Availability Status
20	2	ID	O		0275	00932	Document Storage Status
21	30	ST	C			00933	Document Change Reason
22	250	PPN	C	Y		00934	Authentication Person, Time Stamp
23	250	XCN	O	Y		00935	Distributed Copies (Code and Name of Recipients)

TXA Field Definitions

TXA-1 Set ID - TXA (SI) 00914

Definition: This field contains a number that uniquely identifies this transaction for the purpose of adding, changing, or deleting the transaction.

TXA-2 Document Type (IS) 00915

Definition: This field identifies the type of document (as defined in the transcription system). Refer to *User-Defined Table 0270 - Document Type* for suggested values. The organization is free to add more entries.

Table 7.1.5.1-12 – User-Defined Table 0270 - Document Type

Value	Description	Comment
OTH	Other (CCD)	Used

TXA-3 Document Content Presentation (ID) 00916

Definition: This is a conditional field which is required whenever the message contains content as presented in one or more OBX segments. This field identifies the method by which this document was obtained or originated. Refer to *HL7 Table 0191 – Type of Referenced Data* for valid values.

Table 7.1.5.1-13 – HL7 Table 0191 - Type Of Referenced Data

Value	Description	Comment
AP	Other application data, typically uninterrupted binary data (HL7 V2.3 and later)	
multipart	MIME multipart package (CDA per 2.5.2)	

TXA-6 Origination Date/Time (TS) 00919

```
Components:  <Time (DTM)> ^ <DEPRECATED-Degree of Precision (ID)>
```

Definition: This field contains the date and time the document was created (i.e. dictated, recorded, etc.).

TXA-12 Unique Document Number (EI) 00925

```
Components:  <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^
         <Universal ID (ST)> ^ <Universal ID Type (ID)>

Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^
         <universal ID (st)> ^ <universal ID type (ID)>
```

Definition: This field contains a unique document identification number assigned by the sending system. This document number is used to assist the receiving system in matching future updates to the document, as well as to identify the document in a query. When the vendor does not provide a unique document ID number, some type of document identifier should be entered here, or the Unique Document File name should be utilized. Where the system does not customarily have a document filler number, this number could serve as that value, as well.

TXA-14 Placer Order Number (EI) 00216

```
Components:  <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^
         <Universal ID (ST)> ^ <Universal ID Type (ID)>
```

The component descriptions presented here are provided for readability. The implementer should treat the component descriptions in Chapter 2 as the definitive content.

```
Components:  <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^
         <Universal ID (ST)> ^ <Universal ID Type (ID)>

Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^
         <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field is the placer application's order number.

This is a composite field. The first component is a string of characters that identifies an individual order (. i.e. OBR). It is assigned by the placer (ordering application). It identifies an order uniquely among all orders from a particular ordering application. The second through fourth components contain the (filler) assigning authority of the placing application. The (filler) assigning authority is a string of characters that will be uniquely associated with an application. A given institution or group of intercommunicating institutions should establish a unique list of applications that may be potential placers and fillers and assign unique entity identifiers. The components are separated by component delimiters.

TXA-17 Document Completion Status (ID) 00928

Definition: This field identifies the current completion state of the document. This is a required, table-driven field. Refer to *HL7 Table 0271 - Document Completion Status* for valid values.

Table 7.1.5.1-14 – HL7 Table 0271 - Document completion status

Value	Description	Comment
DO	Documented	
AU	Authenticated	
LA	Legally authenticated	

Table 7.1.5.1-15 –. Document completion status state transition table

Transition (Action)	Old State	New State
T01 Original Notification T02 Original Notification and Content	NA	Dictated In Progress Incomplete

Transition (Action)	Old State	New State
		Pre-authenticated Authenticated Legally authenticated
T03 Status Change Notification T04 Status Change Notification and Content	Dictated	In Progress Incomplete Pre-authenticated Authenticated Legally authenticated
	In Progress	Incomplete Pre-authenticated Authenticated Legally authenticated
	Incomplete	Pre-authenticated Authenticated Legally authenticated
	Pre-authenticated	Authenticated Legally authenticated
	Authenticated	Legally authenticated
	Legally authenticated	NA
	Documented	Pre-authenticated Authenticated Legally authenticated
T05 Addendum Notification T06 Addendum Notification and Content	NA	Dictated In Progress Incomplete Pre-authenticated Authenticated Legally authenticated
T07 Edit Notification T08 Edit Notification and Content	Dictated	In Progress Incomplete Pre-authenticated Authenticated Legally authenticated
	In Progress	Incomplete Pre-authenticated Authenticated Legally authenticated
	Incomplete	Pre-authenticated Authenticated Legally authenticated
	Pre-authenticated	Authenticated Legally authenticated
	Authenticated	Legally authenticated
	Legally authenticated	NA
	Documented	Pre-authenticated Authenticated Legally authenticated
T09 Replacement Notification T10 Replacement Notification and Content	NA	Dictated In Progress Incomplete Pre-authenticated Authenticated Legally authenticated
T11 Cancel Notification	Dictated In Progress Incomplete Pre-authenticated and Availability status of “Unavailable”	Canceled

TXA-18 Document Confidentiality Status (ID) 00929

Definition: This is an optional field which identifies the degree to which special confidentiality protection should be applied to this information. The assignment of data elements to these categories is left to the discretion of the healthcare organization. Refer to *HL7 Table 0272 - Document Confidentiality Status* for valid values.

Table 7.1.5.1-16 – HL7 Table 0272 - Document Confidentiality Status

Value	Description	Comment
R	Restricted	

TXA-19 Document Availability Status (ID) 00930

Definition: This is an optional field which identifies a document's availability for use in patient care. If an organization's business rules allow a document to be used for patient care before it is authenticated, the value of this field should be set to "AV." If a document has been made available for patient care, it cannot be changed or deleted. If an erroneous document has been made available at any point in time and a replacement is not appropriate, then it may be marked as "Canceled" and removed, as in the case of a document being assigned to the wrong patient. Additional information must be provided via an addendum, which is separately authenticated and date/time stamped. If the content of a document whose status is "Available" must be revised, this is done by issuing a replacement, which is separately authenticated and date/time stamped. Refer to *HL7 Table 0273 - Document Availability Status* for valid values.

Table 7.1.5.1-17 – HL7 Table 0273 - Document Availability Status

Value	Description	Comment
AV	Available for patient care	
UN	Unavailable for patient care	

Table 7.1.5.1-18 – Document availability status state transition table

Transition (Action)	Old State	New State	Notes
T01 Original Notification T02 Original Notification and Content	NA	Unavailable Available	
T03 Status Change Notification T04 Status Change Notification and Content	Unavailable	Unavailable Available Obsolete	
	Available	Available Obsolete	
	Obsolete	NA	
T05 Addendum Notification T06 Addendum Notification and Content	NA	Unavailable Available	
T07 Edit Notification T08 Edit Notification and Content	Unavailable	Unavailable Available	
T09 Replacement Notification T10 Replacement Notification and Content	NA	Unavailable Available	Set parent document to "obsolete"
T11 Cancel	Unavailable	Delete	

Note: NA means not applicable.

OBX - Observation/Result Segment

The OBX segment is documented in its entirety in Chapter 7. Its usage as it applies to Medical Records/ Information Management is documented here for clarity.

Table 7.1.5.1-19 – HL7 Attribute Table - OBX – Observation Segment

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			00569	Set ID - OBX

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
2	2	ID	R		0125	00570	Value Type
3	250	CE	O			00571	Observation Identifier
4	20	ST	O			00572	Observation Sub-Id
5	*	*	C/R			00573	Observation Value
6	250	CE	O			00574	Units
7	60	ST	O			00575	References Range
8	5	IS	O	Y/5	0078	00576	Abnormal Flags
9	5	NM	O			00577	Probability
10	2	ID	O		0080	00578	Nature of Abnormal Test
11	1	ID	R/NA		0085	00579	Observation Result Status
12	26	TS	C			00580	Effective Date of Reference Range Values
13	20	ST	C			00581	User Defined Access Checks
14	26	TS	O			00582	Date/Time of the Observation
15	250	CE	C			00583	Producer's Reference
16	250	XCN	O	Y		00584	Responsible Observer
17	250	CE	O	Y		00936	Observation Method
18	22	EI	O	Y		01479	Equipment Instance Identifier
19	26	TS	O			01480	Date/Time of the Analysis

C = For fields OBX-12, OBX-13, and OBX-15, the field should be valued conditionally. These fields should be valued only when the result (OBX-5-observation value) contains a single concept. This is typically true when the result type is numeric, ID, or CE. When multiple medical concepts are expressed, the values of these three fields are ambiguous.* = 256 K or site negotiated

Specialized usage: Observation Identifier/Observation Sub-ID have been used as optional fields that are not required in unstructured text where the nature of the document has been identified in *TXA-2-Document type*, which is a required field, but is expressly allowed in the richer structured documentation. An example includes cases where anatomic reports may have separate OBXs for gross examination, microscopic examination, clinical impression, and final diagnosis. Another possible use includes imbedding non-textual observations within textual reports.

OBX field definitions

OBX-1 Set ID - OBX (SI) 00569

Definition: This field contains the sequence number. For compatibility with ASTM.

OBX-2 Value Type (ID) 00570

Definition: This field contains the format of the observation value in OBX. It must be valued if *OBX-11-Observ result status* is not valued with an 'X". If the value is CE then the result must be a coded entry. When the value type is TX or FT then the results are bulk text. The valid values for the value type of an observation are listed in *HL7 Table 0125 - Value Type*.

The observation value must be represented according to the format for the data type defined in Chapter 2, Section 2.9, "Data Types." For example, a PN consists of 6 components, separated by component delimiters.

Although NM is a valid type, observations which are usually reported as numbers will sometimes have the string (ST) data type because non-numeric characters are often reported as part of the result, e.g., >300 to indicate the result was off-scale for the instrument. In the example, ">300", ">" is a symbol and the digits are considered a numeric value. However, this usage of the ST type should be discouraged since the SN (structured numeric) data type now accommodates such reporting and, in addition, permits the receiving system to interpret the magnitude.

All HL7 data types are valid, and are included in Table 0125 except CM, CQ, SI, and ID. For a CM definition to have meaning, the specifics about the CM must be included in the field definition. *OBX-5-observation value* is a general field definition that is influenced by the data type *OBX-3*, so CMs are undefined in this context. CQ is invalid because units for *OBX-5-observation value* are always specified explicitly in an OBX segment with *OBX-6 units*. SI is invalid because it only applied to HL7 message segments and ID because it requires a constant field definition.

The RP value (reference pointer) must be used if the actual observation value is not sent in OBX but exists somewhere else. For example, if the observation consists of an image (document or medical), the image itself cannot be sent in OBX. The sending system may in that case opt to send a reference pointer. The receiving system can use this reference pointer whenever it needs access to the actual image through other interface standards, e.g., DICOM, or through appropriate data base servers.

Table 7.1.5.1-20 – HL7 Table 0125 - Value type

Value	Description	Comment
ED	Address	

The full definition of these data types is given in Chapter 2, Section 2.9, "Data Types." The structured numeric (SN) data type, new to version 2.3, provides for reporting ranges (e.g., 3-5 or 10-20), titres (e.g., 1:10), and out-of-range indicators (e.g., >50) in a structured and computer interpretable way.

We allow the FT data type in the OBX segment but its use is discouraged. Formatted text usually implies a meaningful structure e.g., a list of three independent diagnoses reported on different lines. But ideally, the structure in three independent diagnostic statements would be reported as three separate OBX segments.

TX should **not** be used except to send large amounts of text. In the TX data type, the repeat delimiter can only be used to identify paragraph breaks. Use ST to send short, and possibly encodable, text strings.

CDA documents are to be exchanged in the OBX segment in any message that can exchange documents (such as MDM or ORU). Within the OBX segment, the MIME package is encoded as an encapsulated (ED) data type.

OBX-3 Observation Identifier (CE) 00571

```
Components:  <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding
         System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate
         Text (ST)> ^ <Name of Alternate Coding System (ID)>
```

Definition: This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). Example: 8625-6^P-R interval^LN.

In most systems the identifier will **point** to a master observation table that will provide other attributes of the observation that may be used by the receiving system to process the observations it receives. A set of message segments for transmitting such master observation tables is described in Chapter 8. The relation of an observation ID to a master observation table is analogous to the relationship between a charge code (in a billing record) and the charge master.

When local codes are used as the first identifier in this field we strongly encourage sending a universal identifier as well to permit receivers to equivalence results from different providers of the same service (e.g., a hospital lab and commercial lab that provides serum potassium to a nursing home). LOINC® is an HL7 approved code system for the Observation identifier. It covers observations and measurements, such as laboratory tests, physical findings, radiology studies, and claims attachments and can be obtained from www.regenstrief.org/loinc/loinc.htm. One possible **universal** identifier is LOINC® codes for laboratory and clinical measurements (see *HL7*

defined Table 0396 and the HL7 www list server) and Appendix X2 of ASTM E1467 for neurophysiology tests.

OBX-5 Observation Value (varies) 00573

Definition: This field contains the value observed by the observation producer. In this case, the CCD is contained in this field. *OBX-2-value type* contains the data type for this field according to which observation value is formatted. .

CCD documents are to be exchanged in the OBX segment. The value of *OBX-2-Value Type* should be set to 'ED'. *OBX-5-Observation Value* contains the MIME package encoded as an encapsulated data type. The components should be valued as follows:

- Set the value of *OBX-5.2-Type of Data* to 'multipart'. (^ may be the correct value)
- Set the value of *OBX-5.3-Data Subtype* to 'x-hl7-cda-level-one' (shall be XML)
- Set the value of *OBX-5.4-Encoding* to 'A'. (Note that a MIME package is not itself Base64-encoded. Rather entities within the MIME package are Base64-encoded. A MIME package is sent as ASCII text. Therefore, the correct value is 'A' not 'Base64'.
- Set the value of *OBX-5.5-Data* to equal the MIME package. Every entity within the MIME package must be Base64-encoded. As stated in Chapter 2, "the data component must be scanned before transmission for HL7 delimiter characters (and other non-printing ASCII or non-ASCII characters such as LineFeed), and any found must be escaped by using the HL7 escape sequences defined in Section 2.7 'Use of escape sequences in text fields'. On the receiving application, the data field must be de-escaped after being parsed". As a result, CR/LF sequences required in the MIME package need to be escaped (i.e., converted to '\X0D0A\') prior to transmission. The content type of the first MIME entity is set to 'application/x-hl7-cda-level-one+xml', and should contain the CCD document itself. Multimedia objects referenced by the CCD document that need to be transmitted within the CCD document are to be placed in successive entities of the MIME package.

OBX-11 Observation Result Status (ID) 00579

Definition: This field contains the observation result status. Refer to *HL7 table 0085 - Observation result status codes interpretation* for valid values. This field reflects the current completion status of the results for one Observation Identifier.

It is a required field. Previous versions of HL7 stated this implicitly by defining a default value of “F.” Code **F** indicates that the result has been verified to be correct and final. Code **W** indicates that the result has been verified to be wrong (incorrect); a replacement (corrected) result may be transmitted later. Code **C** indicates that data contained in the *OBX-5-observation value* field are to replace previously transmitted (verified and) final result data with the same observation ID (including suffix, if applicable) and observation sub-ID usually because the previous results were wrong. Code **D** indicates that data previously transmitted in a result segment with the same observation ID (including suffix) and observation sub-ID should be deleted. When changing or deleting a result, multiple OBX segments with the same observation ID and observation sub-ID are replaced or deleted as a unit. Normal progression of results through intermediate (e.g., ‘gram positive cocci’) to final (e.g., ‘staphylococcus aureus’) should not be transmitted as **C** (correction); they should be transmitted as **P** or **S** (depending upon the specific case) until they are final.

There are situations where the observation battery required for the order needs to be dynamically specified at the time of ordering. That is, this battery is then defined by the set of OBX segments transmitted along with the order and generated by the placing system. For example, timed measurements of serum glucose challenge tests may vary among laboratories. One institution may report them at –30, -15, 0, 30, 60, and 120 minutes, while another may report them at –30, 0, 30, 60, 90, and 120 minutes. Master file entries may exist for each individual element of the battery but not for the battery itself. Another example may be Renin Studies where the specification may be done upon ordering without having a master file definition for each permutation of the possible element. The OBX segments in the ORM message can be used to

create dynamic specifications to accommodate these permutations without defining pre-existing master file definitions for the battery itself. The result status field in the OBX can be used to indicate whether the OBX in the ORM message is used to provide a dynamic specification or is used to communicate a result as context to the order. The status of O shall be used to indicate that the OBX segment is used for a dynamic specification of the required result. An OBX used for a dynamic specification must contain the detailed examination code, units, etc., with *OBX-11* valued with O, and *OBX-2* and *OBX-5* valued with null.

Table 7.1.5.1-21 – HL7 Table 0085 - Observation result status codes interpretation

Value	Description	Comment
F	Final results; Can only be changed with a corrected result.	

ACK – General Acknowledgment

The simple general acknowledgment (ACK) can be used where the application does not define a special application level acknowledgment message or where there has been an error that precludes application processing. It is also used for accept level acknowledgments. The details are described in the Section below.

MSA - message acknowledgment segment

The MSA segment contains information sent while acknowledging another message.

Table 7.1.5.1-22 – HL7 Attribute Table - MSA - Message Acknowledgment

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	2	ID	R		0008	00018	Acknowledgment Code
2	20	ST	R			00010	Message Control ID
3	80	ST	B			00020	Text Message
4	15	NM	O			00021	Expected Sequence Number
5			W			00022	Delayed Acknowledgment Type
6	250	CE	B		0357	00023	Error Condition

MSA field definitions

MSA-1 Acknowledgment Code (ID) 00018

Definition: This field contains an acknowledgment code, see message processing rules. Refer to *HL7 Table 0008 - Acknowledgment code* for valid values.

Table 7.1.5.1-23 – HL7 Table 0008 - Acknowledgment code

Value	Description	Comment
AA	Original mode: Application Accept - Enhanced mode: Application acknowledgment: Accept	
AE	Original mode: Application Error - Enhanced mode: Application acknowledgment: Error	
AR	Original mode: Application Reject - Enhanced mode: Application acknowledgment: Reject	

MSA-2 Message Control ID (ST) 00010

Definition: This field contains the message control ID of the message sent by the sending system. It allows the sending system to associate this response with the message for which it is intended.

ERR field definition

ERR-1 Error code and location (CM) 00024

```
Components:  <segment ID (ST)> ^ <sequence (NM)> ^ <field position
        (NM)> ^ <code identifying error (CE)>
```

Definition: This field identifies an erroneous segment in another message. The second component is an index if there is more than one segment of type <segment ID>. For systems that do not use the HL7 Encoding Rules, the data item number may be used for the third component. The fourth component (which references *HL7 Table 0357 - Message error condition codes* (as a CE data type)) is restricted from having any subcomponents as the subcomponent separator is now the CE's component separator.

Table 7.1.5.1-24 – HL7 Table 0357 - Message error condition codes

Error Condition Code	Error Condition Text	Description/Comment
Success		
0	Message accepted	Success. Optional, as the AA conveys success. Used for systems that must always return a status code.
Errors		
100	Segment sequence error	The message segments were not in the proper order, or required segments are missing.
101	Required field missing	A required field is missing from a segment
102	Data type error	The field contained data of the wrong data type, e.g. an NM field contained "FOO".
103	Table value not found	A field of data type ID or IS was compared against the corresponding table, and no match was found.
Rejection		
200	Unsupported message type	The Message Type is not supported.
201	Unsupported event code	The Event Code is not supported.
202	Unsupported processing id	The Processing ID is not supported.
203	Unsupported version id	The Version ID is not supported.
204	Unknown key identifier	The ID of the patient, order, etc., was not found. Used for transactions *other than* additions, e.g. transfer of a non-existent patient.
205	Duplicate key identifier	The ID of the patient, order, etc., already exists. Used in response to addition transactions (Admit, New Order, etc.).
206	Application record locked	The transaction could not be performed at the application storage level, e.g. database locked.
207	Application internal error	A catchall for internal errors not explicitly covered by other codes.

Sample ERR-1 segment - ERR-1|MSH|5555|MSH-3|101

Sample Error message:

MSH|^~\&|ACS-EHR|ACS|TESTVENDOR|^1164401121^DNS|20080514||DOC^T12|38d7853a-ac3f-4407-8837-f6766b6ce574|P|2.4|
MSA|AE|38d7853a-ac3f-4407-8837-f6766b6ce574|
ERR|Could not create a valid CCD because of no data for this patient |
QRD|20091208|D|I|0|||^ZO|^^^|OTH|48769-4^Continuity of Care panel^LN^CCD|PID||345678912|PATIENT||^|
PV1|1|N|
TXA|1|HP|||||||||ACS.CYBERACCESS|DB734647-FC99-424C-A864-7E3CDA82E703|||||AU|

Chapter 8 Technical Specifications of the CCD

8.1 Required Documentation

The following are the minimum requirements for being able to produce a CCD and this list constitutes the Required Reading List.

You will need a fair familiarity with the following:

- **HITSP C32 v2.5 – Summary Documents using the Continuity of Care Document**

  http://www.hitsp.org/ConstructSet_Details.aspx?&PrefixAlpha=4&PrefixNumeric=32

- **CDA Documentation from HL7**[CDA_r2_normativewebedition.zip]

  This is available as a download from http://www.hl7.org. The file is known as CDA_r2_normativewebedition.zip. This is the HL7 reference documentation for version 2 of the Clinical Document Architecture or CDA on which the CCD is based.

- **CDA Release 2 – Continuity of Care Document Implementation Guide**

  This is available as a download from http://www.hl7.org. The file is known as HL7_CCD_final.zip. This is the HL7 reference documentation for the Continuity of Care Document or CCD.

- **Alschuler Associates Web Site** at http://www.alschulerassociates.com

  This site contains both a Quick Start Guide for the Clinical Document Architecture and the Continuity of Care document. Excellent reference source for both CDA conformant structure and CCD content.

- NIST at http://xreg2.nist.gov/cda-validation/validation.html

  This site contains validation tools for testing CDA and CCD formats.

8.2 CDA Schemas

Within the CCD and CDA documentation found at http://www.hl7.org, you will need a working knowledge of how to trace through the following XML schemas

POCD_MT0000040.XSD **V3 Messaging Schema for the CDA**

You will need to navigate this to understand how to add sections to a CDA as the CCD documentation assumes a certain awareness on your part of how the XML segments are built and to a smaller extent, how V3 Messaging works. The CCD may specify that you need to use an ‘Act’ to document a diagnosis as a ‘problem’. In that case, you need to search out the POCD_MT0000040.XSD to find "Act" to understand all the possible node names and their data types that can be used to document the ‘Act’. The 'Act' will specify additional nodes that can have their own nodes and so you must trace through several levels to see the full potential for documentation.

8.3 DATATYPES.XSD and DATATYPES-BASE.XSD

When you know a data type required by looking in the POCD_MT0000040.XSD schema, you will then need to look up the data type in one of these schemas to understand how to document the data in the data type properly and possibly even understand relations between sets of data type nodes.

8.3.1 VOC.XSD

When you need to know the valid values that can be used in certain data types, you use this schema to find the list of valid values. This will not tell you what those values mean. In some cases this information can be found in the Quick Start guides or the CCD documentation. You may also look in the HL7 V3 Reference Information Model database. The 0211 version was used to develop our Annotated Sample. You may download the RIM from www.hl7.org in the HL7 member's area.

8.3.2 Coding Systems

You will need to have a familiarity with the following systems:

International Classification of Disease (ICD-9 CM)
Clinical Procedure Terminology (CPT4 and HCPCS)
SNOMED- CT
LOINC (Logical Observation Identifiers Names and Codes)
National Drug Code (NDC)
RxNorm
HL7 Tables

Note: The sample uses ICD-9 and CPT-4 codes; however, the CCD standard calls for SNOMED and LOINC codes. Therefore, the CCD validator will throw warning messages. However, these warnings can safely be ignored.

8.3.2.1 Procedure activity - warning validation phase

The value for "[Act | Observation | Procedure] / code" in a procedure activity SHOULD be selected from LOINC (codeSystem 2.16.840.1.113883.6.1) or SNOMED CT (codeSystem 2.16.840.1.113883.6.96).

This warning may be ignored since CCD documentation allows ICD9 and CPT-4 but indicates them as MAY use vs. SHOULD use.

For applications involving Lab results and Vital Signs, you will need programmatic access to information on valid units as produced by the Unified Code for Units of Measure (UCUM) at http://aurora.rg.iupui.edu/UCUM or http://www.regenstrief.org/medinformatics/ucum/downloads

For applications, you may need programmatic access to the HL7 Version 3 Reference Information Model or some subset of its tables. ACS is currently using the 0211 version for development. The RIM databases are in MS Access format and be downloaded from http://www.hl7.org by HL7 members.

8.3.2.2 Cross References:

1. Cross references between SNOMED and ICD-9 and CPT-4 may be required to adapt the samples.
2. Cross references between HL7 Version 2.xx tables and some V3 tables will be required if you are already using and have reference tables in HL7 2.xx.

8.4 Sample CCD document

The provided sample in Appendix A is intended as an effort to start the development process and suggest a reasonable means to document data items that will be sent from an external system and do so in a manner that conforms to the requirements of CCD. It is certain that some process decisions will be made that alter the exact documentation methodology but this sample should be sufficient for our purposes. Building the final CCD will require regular contact between developers at ACS and partner organizations.

8.4.1 General Approach to the Annotated Sample

When developing the annotated sample, in addition to healthcare provider data, Payer data is also accommodated compliant with the standard CCD format. There is minimum focus on the narrative sections [display data] since this document is intended as a machine readable document and not primarily for display. All narrative sections remain conformant to the CCD requirements but have a simple statement indicating their intended use with one exception. The Allergies and Alert section in CCD is limited to documenting an allergy to a manufactured product. As a result, it is not possible to document an allergy to something like peanuts without generating a warning in the CCD validation. Since the narrative is a required section in the CCD, we opted to document alerts that do not fit the current CCD definition in the narrative section. You will see this when you view the Annotated Sample provided.

8.4.2 Special Considerations

There are a few limitations of the CCD format, based primarily around the CCR dataset, where the dataset is strictly defined and may not be extended. These restrictions affect the documents ACS will create in the following ways:

8.4.2.1 List of Pharmacies

There is no section in CCD to place a list of pharmacies directly so such a list would have to be created as "Supply" documentation on each drug where the Pharmacy ID and Name are identified. The Annotated Sample provides a means to accomplish this documentation.

8.4.2.2 List of Healthcare Providers

The list of Healthcare Providers is similar and is setup in the Annotated Sample as a 'Performer' entry on each Medication, Diagnosis and Procedure entry. See the POCD_MT000040.XSD schema and the samples for details on the <performer> node.

8.4.2.3 Images

We have opted to include the images of the Patient, Medicaid Card and the Driver License (when available) in the CCD "Purpose" section as an act/entryRelationship/observationMedia segment. The pictures should be low resolution, small images in Portable Network Graphic (PNG) format converted to base64 encoded data.

Based on the standard for the CCD, HITSP-C32, there are no designated locations for Pharmacy, Provider and Image. In order to adhere to the HITSP-C32 standard, we are identifying portions of the CCD that would otherwise not be used.

8.4.3 Building a CCD Manually

Since the CCD is an XML document based around the Clinical Document Architecture, there are several things to consider while developing a CCD.

8.4.3.1 CDA/CCD Schemas

CDA.XSD
: Points to the main schema called POCD_MT000040.xsd

POCD_MT000040.XSD
: Definitions for HL7 V3 Message Type POCD_MT000040.xsd

VOC.XSD
: Definitions of the vocabulary (lists the actual values of choice items)

DATATYPES-BASE.XSD
: Defines the root data types used in the XML

DATATYPES.XSD
: Defines the data types based on root data types

8.4.4 CCD Documentation

There is documentation of the CCD from HL7, "CCD-final.doc" that comes with the HL7_CCD_Final.zip

file you will download from http://www.hl7.org. This documentation covers all the sections and gives some limited samples. The documentation assumes knowledge of HL7 V3 concepts therefore takes some time to absorb in certain instances, particularly when you need to study other documentation sources to get a full understanding. Reading the documents listed in Required Documentation will make this less of an issue.

Alschuler Associates web site has a CDA Quick Start Guide and a CCD Quick Start Guide that is helpful in building conformant documents. Most importantly, they also have validation tools to validate your CCD for both form and content. You will want to take maximum advantage of these tools. There were the tools we used to validate our annotated sample.

8.4.4.1 Samples

The annotated sample with much of the CCD documentation information inside is available to use for checking how a particular instance of Patient Health information can be included into the CCD. There are other less complex samples available with the CCD documentation package and in the Quick Start Guides. The documentation methods shown in this sample may be altered as the process of determining the best transfer methodology is worked out.

8.4.5 Using the Documentation, Schemas & Samples

In the effort to add in your available data and find the right way to include it in the CCD, the following order of operations may prove helpful –

1. Check the CCD-final.doc file for the sections dealing with the part of the Patient Health Information you are intending to document.
2. Check the sample that came with the CCD documentation to find any examples of how the information can be documented.
3. Check the annotated sample supplied for an example.
4. If you are unsure of the data type required to document a particular item, look through the datatypes-base.xsd file or datatypes.xsd to discern the capabilities of a particular data type.

8.4.5.1 Searching Example:

The file, POCD-MT000040.XSD, is found on the HL7 website. It is part of the CDA Release 2 documentation and is available to members.

If you are working with a section that defines e.g. <entryRelationship> [a means of associating subentries further describing <entry>], you can go to the POCD_MT000040.XSD messaging schema and search for 'entryRelationship'. This will show an entry as follows:

```
<xs:element name="entryRelationship"
type="POCD_MT000040.EntryRelationship" minOccurs="0"
maxOccurs="unbounded"/>
```

Where the type is shown as: POCD_MT000040.EntryRelationship, enter that as the search criteria and look again to find a section that defines the complexType as:

```
<xs:complexType name="POCD_MT000040.EntryRelationship">
<xs:sequence>
<xs:element name="realmCode" type="CS" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="typeId"
type="POCD_MT000040.InfrastructureRoot.typeId" minOccurs="0"/>
<xs:element name="templateId" type="II" minOccurs="0"
maxOccurs="unbounded"/>
```

```
<xs:element name="sequenceNumber" type="INT" minOccurs="0"/>
<xs:element name="seperatableInd" type="BL" minOccurs="0"/>
<xs:choice>
<xs:element name="act" type="POCD_MT000040.Act"/>
<xs:element name="encounter" type="POCD_MT000040.Encounter"/>
<xs:element name="observation" type="POCD_MT000040.Observation"/>
<xs:element name="observationMedia"
type="POCD_MT000040.ObservationMedia"/>
<xs:element name="organizer" type="POCD_MT000040.Organizer"/>
<xs:element name="procedure" type="POCD_MT000040.Procedure"/>
<xs:element name="regionOfInterest"
type="POCD_MT000040.RegionOfInterest"/>
<xs:element name="substanceAdministration"
type="POCD_MT000040.SubstanceAdministration"/>
<xs:element name="supply" type="POCD_MT000040.Supply"/>
</xs:choice>
</xs:sequence>
<xs:attribute name="nullFlavor" type="NullFlavor"
use="optional"/>
<xs:attribute name="typeCode"
type="x_ActRelationshipEntryRelationship" use="required"/>
<xs:attribute name="inversionInd" type="bl" use="optional"/>
<xs:attribute name="contextConductionInd" type="bl"
use="optional" default="true"/>
<xs:attribute name="negationInd" type="bl" use="optional"/>
</xs:complexType>
```

From this definition, you can see that you can choose to create an <entryRelationship> to support a new:

POCD_MT000040.Act,
[possibly to document a problem or diagnosis]
POCD_MT000040.Encounter,
[possibly to document an Encounter such a Hospital Visit]
POCD_MT000040.Observation,
[possibly to document an observed result such a lab]
POCD_MT000040.ObservationMedia,
[possibly to add pictures, sound, etc…]
POCD_MT000040.Organizer,
[possibly to organize lab results, vital signs, etc… in groups]
POCD_MT000040.Procedure,
[possibly to add a procedure]
POCD_MT000040.RegionOfInterest,
[we will look this one up as part of an exercise following]
POCD_MT000040.SubstanceAdministration
[possibly to document a drug]
POCD_MT000040.Supply
[possibly to document the Supply of a Substance]

Since we are not sure of 'RegionOfInterest', we can pursue it further by searching for it starting at the top of the POCD_MT000040.XSD. That will bring you to a line as follows:

```
<xs:element name="regionOfInterest"
type="POCD_MT000040.RegionOfInterest"/>
```

In this line, select the text "POCD_MT000040.RegionOfInterest" and search the

POCD_MT000040.XSD from the top again until you find a line as follows, indicating you have found the definition for the complex type with additional nodes:

```
<xs:complexType name="POCD_MT000040.RegionOfInterest">
```

Here you can see that this type defines additional values as follows:

```
<xs:element name="realmCode" type="CS" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="typeId"
type="POCD_MT000040.InfrastructureRoot.typeId" minOccurs="0"/>
<xs:element name="templateId" type="II" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="id" type="II" maxOccurs="unbounded"/>
<xs:element name="code" type="CS"/>
<xs:element name="value"
type="POCD_MT000040.RegionOfInterest.value"
maxOccurs="unbounded"/>
<xs:element name="subject" type="POCD_MT000040.Subject"
minOccurs="0"/>
<xs:element name="specimen" type="POCD_MT000040.Specimen"
minOccurs="0" maxOccurs="unbounded"/>
<xs:element name="performer" type="POCD_MT000040.Performer2"
minOccurs="0" maxOccurs="unbounded"/>
<xs:element name="author" type="POCD_MT000040.Author"
minOccurs="0" maxOccurs="unbounded"/>
<xs:element name="informant" type="POCD_MT000040.Informant12"
minOccurs="0" maxOccurs="unbounded"/>
<xs:element name="participant" type="POCD_MT000040.Participant2"
minOccurs="0" maxOccurs="unbounded"/>
<xs:element name="entryRelationship"
type="POCD_MT000040.EntryRelationship" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="reference" type="POCD_MT000040.Reference"
minOccurs="0" maxOccurs="unbounded"/>
<xs:element name="precondition" type="POCD_MT000040.Precondition"
minOccurs="0" maxOccurs="unbounded"/>
```

Suppose now that you are interested in pursuing “Precondition”. You can now search for “POCD_MT000040.Precondition” to get a sense of what is defined as a precondition. This leads to a find as follows:

```
<xs:complexType name="POCD_MT000040.Precondition">
<xs:sequence>
<xs:element name="realmCode" type="CS" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="typeId"
type="POCD_MT000040.InfrastructureRoot.typeId" minOccurs="0"/>
<xs:element name="templateId" type="II" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="criterion" type="POCD_MT000040.Criterion"/>
```

Your interest now is in how to define the criterion of a precondition. Select the text “POCD_MT000040.Criterion” and search again to find:

```
<xs:complexType name="POCD_MT000040.Criterion">
```

```
<xs:sequence>
<xs:element name="realmCode" type="CS" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="typeId"
type="POCD_MT000040.InfrastructureRoot.typeId" minOccurs="0"/>
<xs:element name="templateId" type="II" minOccurs="0"
maxOccurs="unbounded"/>
<xs:element name="code" type="CD" minOccurs="0"/>
<xs:element name="text" type="ED" minOccurs="0"/>
<xs:element name="value" type="ANY" minOccurs="0"/>
```

Your interest is to find out how to specify the “value” of criterion, so now choose the type of “ANY” for search and look in the DATATYPES-BASE.XSD to find out what may be put in “ANY”. This will lead to the following definition:

```
<xs:complexType name="ANY" abstract="true">
<xs:annotation>
<xs:documentation>
      Defines the basic properties of every data value. This
      is an abstract type, meaning that no value can be just
      a data value without belonging to any concrete type.
      Every concrete type is a specialization of this
      general abstract DataValue type.

</xs:documentation>
</xs:annotation>
<xs:attribute name="nullFlavor" type="NullFlavor" use="optional">
<xs:annotation>
<xs:documentation>
      An exceptional value expressing missing information
      and possibly the reason why the information is missing.

</xs:documentation>
</xs:annotation>
</xs:attribute>
</xs:complexType>
```

Since many of the base data types are extensions of the ANY data, you can go to DATATYPES.XSD and choose a concrete type to use and enter into your CCD to document the criterion such as the CE type shown below:

```
<precondition typeCode="PRCN">
      <criterion>
            <code code="ASSERTION"
      codeSystem="2.16.840.1.113883.5.4"/>
            <!-- SNOMED -->
            <value xsi:type="CE" code="56018004"
            codeSystem="2.16.840.1.113883.6.96"
            displayName="Wheezing"/>
      </criterion>
</precondition>
```

Chapter 9 Testing

Completion of the testing process must occur prior to electronic submission. Assistance from ACS Business Analysts is available throughout this process. Each test transmission is inspected thoroughly to ensure no format errors are present. Testing is conducted to verify the integrity of the format, not the integrity of the data; however, in order to simulate a production environment, we request that you send real transmission data. The number of test transmissions required depends on the number of format errors on a transmission and the relative severity of these errors. Additional testing may be required in the future to verify any changes made to ACS' system.

A detailed description of the testing process is described in Section 4.3.3 - EMR Integration Testing.

9.1 Trading Partner Testing Procedures

The following are the Trading Partner testing procedures:

1. KHIE makes available companion guides and enrollment packages for download via the web.
2. Trading Partner completes enrollment package and submits to the individuals described in Chapter 2.
3. Trading Partner is assigned Logon Name and Logon User ID.
4. Trading Partner contacts the ACS Interoperability Coordinator to arrange a testing schedule.
5. Trading Partner executes test cases and data is sent to ACS.
6. Business Analyst evaluates flow of test data through the ACS system.
7. If test cases are completed successfully, the Business Analyst contacts Trading Partner and the Trading Partner is approved for placement into production environment when available. If the testing entity is a software vendor, they will be required to provide a list of Submitters using the approved software package.
8. If test cases are unsuccessful, the Business Analyst will contact Trading Partner. The Trading Partner will remain in the testing environment until test cases are completed successfully.

Appendix A - Sample CCD for KHIE – XML Source

A rendering of how the following XML sample will appear in a web browser is available in Appendix B. The following is a sample of the XML structure of a CCD document:

```
<?xml-stylesheet type="text/xsl" href="CCD.xsl"?>
<ClinicalDocument xmlns="urn:hl7-org:v3"  xmlns:voc="urn:hl7-org:v3/voc"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v3 CDA.xsd" >
      <typeId root="2.16.840.1.113883.1.3"  extension="POCD_HD000040" />

      <!-- [ REQUIRED] CCD v1.0 Templates Root -->
      <templateId root="2.16.840.1.113883.10.20.1" />
      <templateId root="2.16.840.1.113883.3.88.11.32.1" />

      <!--
             [ REQUIRED] Document ID, a GUID of the datatype II, Instance
Identifier, identifies this document
            Your system will need to assign a GUID and insert it here to
uniquely identify
            this document.
-->
      <id root="db734647-fc99-424c-a864-7e3cda82e703" />

      <!-- [ REQUIRED] The CCD will ALWAYS be 34133-9  Summarization of
episode note
                  This is a LOINC code.

                  CONF-ex7:   The value for ClinicalDocument / code SHALL be
                  34133-9 Summarization of episode note
      2.16.840.1.113883.6.1 LOINC STATIC.
-->
      <code code="34133-9"  codeSystem="2.16.840.1.113883.6.1"
displayName="Summarization of episode note" />

      <!-- [ REQUIRED] Set title to YOUR System Name -->
      <title>InfoSolutions Patient Summary</title>

      <!--
            This time can be derived from the System time when this CCD was
generated.
            ASTM CCR further requires that the time be precise to the second,
            and must express a time zone offset.

      CCR Creation DateTime must be expressed in ISO-8601 date-time format,
with precision
      to include seconds. All date times expressed in Hours, Minutes, and/or
Seconds in the
      CCR must express a time zone offset, either using Z [universal
coordinated time, or Zulu
      time], or an offset in hours and minutes. The CCR further requires that
the time zone offset
      be a legal time zone. This latter constraint cannot be expressed in the
schema, as time
      zones are determined by political entities [for example, Nations or
```

```
States]. There presently
      exist time zones in the form ##:15 and ##:30. CCR Creation DateTime
time should ideally
      come from a net-based atomic time service and not from an individual
computing device
      internal clock.

            Translation :
      Give the LOCAL time and then say what that offset is from UTC and use
the ISO-8601 format to express it.

-->
      <effectiveTime value="20071207130000+0500" />

      <!--
      From the POCD_HD000040.xsd schema and also the V2 version table 0272,
      option was made to default to Restricted.
-->
      <confidentialityCode code="R"  codeSystem="2.16.840.1.113883.5.25" />

      <!-- See voc.xml in the CCD documentation package for other language
codes and/or the ISO639-1 standard-->
      <languageCode code="en-US" />

      <!-- See CDA R2 Documentation, POCD_HD000040.xsd, datatypes.xsd,
                  datatypes-base.xsd, voc.xsd and RIM version 2.11 Database
            and the CCD-final.doc for direction and values.
 -->

      <!-- this is the CDA/CCD way to send data about a patient -->
      <recordTarget>
            <patientRole>

                  <!-- This is where you give the patient an ID number as an
II, Instance Identifier i.e a GUID
      It is UNBOUNDED in POCD_HD000040.xsd so there can be many ID values
-->
                  <!-- Social Security Number [ see the CCD final
documentation for the root values ] -->
                  <id root="2.16.840.1.113883.4.1"  extension="123456789" />

                  <!-- Driver's License [ see the CCD final documentation for
the root values ] -->
                  <id root="2.16.840.1.113883.4.3"  extension="1234567890" />

                  <!-- Home Address [ see the CCD final documentation for
samples ] -->
                  <addr use="HP" >
                        <streetAddressLine>
                              Street Address
                        </streetAddressLine>
                        <streetAddressLine>
                              Street Address
                        </streetAddressLine>
                        <city>City</city>
                        <county>County</county>
                        <state>State</state>
```

```
                        <country>US</country>
                        <postalCode>Zip Code</postalCode>
                  </addr>

                  <!-- Work Address [ see the CCD final documentation for the
root values ] -->
                  <addr use="WP" >
                        <streetAddressLine>
                              Street Address
                        </streetAddressLine>
                        <streetAddressLine>
                              Address
                        </streetAddressLine>
                        <city>City</city>
                        <county>County</county>
                        <state>State</state>
                        <country>US</country>
                        <postalCode>Zip Code</postalCode>
                  </addr>

                  <!-- Home Phone (Home Primary) -->
                  <telecom value="tel:+19995551212"  use="HP" />

                  <!-- Work Phone (WP = Work Place) -->
                  <telecom value="tel:+19995551212"  use="WP" />

                  <!-- Cell Phone (MC = Mobile Contact) -->
                  <telecom value="tel:+19995551212"  use="MC" />

                  <!-- Home (email address) -->
                  <telecom value="mailto:email address"  use="HP" />

                  <!-- Work (email address) -->
                  <telecom value="mailto:email address"  use="WP" />

                  <patient>
                        <name>
                              <given>Given Name</given>
                              <family>Family Name</family>
                              <suffix>Jr. or Sr., etc...</suffix>
                        </name>

                        <!-- Gender codes and code system are in the most
recent RIM Database
     ( look in tables VCS_code_system, VOC_value_set, and
VOC_nested_value_set )
 -->
                        <administrativeGenderCode code="M"
codeSystem="2.16.840.1.113883.5.1"  displayName="Male" />

                        <!-- Birth Date (Need YEARMONTHDAY format) -->
                        <birthTime value="19540101" />

                        <!-- Marital Status [ see the RIM value sets for the
values ]
     ( look in tables VCS_code_system, VOC_value_set, and
VOC_nested_value_set )
```

```
-->
                        <maritalStatusCode code="M"
codeSystem="2.16.840.1.113883.5.2"  displayName="Married" />

                        <!-- Religious Affiliation [ see the RIM value sets
for the values ]
     ( look in tables VCS_code_system, VOC_value_set, and
VOC_nested_value_set )
-->
                        <religiousAffiliationCode code="1004"
codeSystem="2.16.840.1.113883.5.1076"  displayName="Agnosticism" />

                        <!-- Race [ see the RIM value sets for the values ]
     ( look in tables VCS_code_system, VOC_value_set, and
VOC_nested_value_set )
-->
                        <raceCode code="2131-1"
codeSystem="2.16.840.1.113883.6.238" />

                        <birthplace>
                              <place>
                                    <addr use="HP" >
                                          <streetAddressLine>
                                                Street Address
                                          </streetAddressLine>
                                          <streetAddressLine>
                                                Address
                                          </streetAddressLine>
                                          <city>City</city>
                                          <county>County</county>
                                          <state>State</state>
                                          <country>Country</country>
                                          <postalCode>Zip Code</postalCode>
                                    </addr>
                              </place>
                        </birthplace>

                        <!-- See voc.xml in the CCD documentation package for
other language codes and/or the ISO639-1 standard-->
                        <languageCommunication>
                              <languageCode code="en-US" />
                        </languageCommunication>

                  </patient>
            </patientRole>
      </recordTarget>

      <!-- Author of this document -->
      <author>

            <!--
      This time can be derived from the System time when this CCD was
generated.
      ASTM CCR further requires that the time be precise to the second,
and must express a time zone offset.

      CCR Creation DateTime must be expressed   in ISO-8601 date-time format,
```

```
with precision to include seconds. All date times expressed in Hours,
Minutes, and/or Seconds in the CCR must express a time zone offset, either
using Z [universal coordinated time, or Zulu time], or an offset in hours and
minutes. The CCR further requires that the time zone offset be a legal time
zone. This latter constraint cannot be expressed in the schema, as time zones
are determined by political entities [for example, Nations or States]. There
presently exist time zones in the form ##:15 and ##:30. CCR Creation DateTime
time should ideally come from a net-based atomic time service and not from an
individual computing devices internal clock.
            Translation :
      Give the LOCAL time and then say what that offset is from UCT and use
the ISO-8601 format to express it.

            -->
            <time value="20071207130000+0500" />

            <!-- EMR system is both the author and the legal authenticator --
>
            <assignedAuthor>
                  <id root="db734647-fc99-424c-a864-7e3cda82e703" />

                  <!-- System SOFTWARE-->
                  <assignedAuthoringDevice>
                        <softwareName>EMR System Software</softwareName>
                  </assignedAuthoringDevice>
                  <representedOrganization>

                        <!-- Name of EMR System -->
                        <name>EMR System</name>
                  </representedOrganization>
            </assignedAuthor>
      </author>

      <!-- Custodian -->
      <custodian>
            <assignedCustodian>
                  <representedCustodianOrganization>
                        <id root="db734647-fc99-424c-a864-7e3cda82e703" />
                        <!-- Name of EMR System -->
                        <name>EMR System</name>
                  </representedCustodianOrganization>
            </assignedCustodian>
      </custodian>

      <!-- Participants [ May need to loop thru a list... ]
-->
      <!-- Indirect Participant (ECON) [ REPEAT for other ECON participants ]
-->
      <participant typeCode="IND" >
            <time value="20071013" />
            <associatedEntity classCode="ECON" >
                  <!-- The specified coding scheme can be found in the
VOC_Nested_Value_Set table in the RIM Database -->
                  <code code="MTH"  codeSystem="2.16.840.1.113883.5.111"
displayName="Mother" />
                  <addr use="HP" >
                        <streetAddressLine>
```

```
                        Street Address
                    </streetAddressLine>
                    <streetAddressLine>
                        Address
                    </streetAddressLine>
                    <city>City</city>
                    <county>County</county>
                    <state>State</state>
                    <country>Country</country>
                    <postalCode>Zip Code</postalCode>
                </addr>
                <telecom value="tel:(999)555-1212" />
                <telecom value="mailto:email address"  use="HP" />
                <associatedPerson>
                    <name>
                        <given>Given Name + </given>
                        <family>Family Name</family>
                    </name>
                </associatedPerson>
            </associatedEntity>
        </participant>

        <!-- Indirect Participant (Next Of Kin) [ REPEAT for other NOK
participants ] -->
        <participant typeCode="IND" >
            <time value="20070101" />
            <associatedEntity classCode="NOK" >
                <!-- The specified coding scheme can be found in the
VOC_Nested_Value_Set table in the RIM Database -->
                <code code="MTH"  codeSystem="2.16.840.1.113883.5.111"
displayName="Mother" />
                <addr use="HP" >
                    <streetAddressLine>
                        Street Address
                    </streetAddressLine>
                    <streetAddressLine>
                        Address
                    </streetAddressLine>
                    <city>City</city>
                    <county>County</county>
                    <state>State</state>
                    <country>Country</country>
                    <postalCode>Zip Code</postalCode>
                </addr>
                <telecom value="tel:(999)555-1212" />
                <telecom value="mailto:email address"  use="HP" />
                <associatedPerson>
                    <name>
                        <given>Given Name + </given>
                        <family>Family Name</family>
                    </name>
                </associatedPerson>
            </associatedEntity>
        </participant>

        <!-- this starts the documentation of medical history and ends the
Header -->
```

```
      <documentationOf>
            <!-- This MUST be "PCPR" for CCD -->
            <serviceEvent classCode="PCPR" >
                  <effectiveTime>
                        <!-- Dates that this documentation will cover.
                  These dates will determine the data pulled from your
                  database to fill in the segments to come in the body.
      -->
                        <low value="20060101" />
                        <high value="20071231" />
                  </effectiveTime>
            </serviceEvent>
      </documentationOf>

      <!--
**********************
XML based CCD Body
**********************
-->

      <component>
            <structuredBody>
                  <!--


************************
Purpose section
************************

Represents the specific reason for which the summarization was generated,
      such as in response to a request. The general use case does not require
a purpose.
      Purpose should be utilized when the CCD has a specific purpose such as
a transfer,
      referral, or patient request.

      See CCD-final.doc section 2.8 documentation for further details
-->
                  <component>
                        <section>

                              <!-- CCD does not require this section but if
you use the section, you must at least give it a title and narrative text.
      -->

                              <!-- [ REQUIRED ] Purpose section template -->
                              <templateId root="2.16.840.1.113883.10.20.1.13"
/>

                              <!-- [ REQUIRED]  Summary purpose CCD Document
                  This is a LOINC code.
                  48764-5 Summary purpose CCD Document 2.16.840.1.113883.6.1
LOINC STATIC.
-->
                              <code code="48764-5"
codeSystem="2.16.840.1.113883.6.1" />
```

```
                              <!-- [ REQUIRED ]  Section Title -->
                              <title>Purpose : Automated Medical History
Summary</title>

                              <!-- [ REQUIRED ]  Narrative Section -->
                              <text>
                                    <paragraph>Automated Medical History
Summary for Transfer of Data to Alabama ECST</paragraph>
                              </text>

                              <!-- Observations Section -->
                              <entry>
                                    <act classCode="ACT"  moodCode="EVN" >
                                          <templateId
root="2.16.840.1.113883.10.20.1.30" />
                                          <code code="23745001"
codeSystem="2.16.840.1.113883.6.96"  displayName="Documentation Procedure" />
                                          <statusCode code="completed" />
                                          <entryRelationship typeCode="RSON"
>
                                                <observation classCode="OBS"
moodCode="EVN" >
                                                      <code nullFlavor="NA"
/>
                                                      <statusCode
code="completed" />
                                                      <participant
typeCode="DIR" >
                                                            <participantRole>
                                                                  <code
code="SELF"  codeSystem="2.16.840.1.113883.5.111"  displayName="Self" />
      </participantRole>
                                                      </participant>
                                                      <entryRelationship
typeCode="REFR" >
                                                            <observationMedia
classCode="OBS"  moodCode="EVN" >
                                                                  <id
root="2.16.840.1.113883.4.3" />
      <value></value>
      </observationMedia>
                                                      </entryRelationship>
                                                      <entryRelationship
typeCode="REFR" >
                                                            <observationMedia
classCode="OBS"  moodCode="EVN" >
                                                                  <id
root="1fe2cdd0-7aad-11db-9fe1-0800200c9a66" />
      <value>base64 encoded data</value>
      </observationMedia>
                                                      </entryRelationship>
                                                      <entryRelationship
```

```
typeCode="REFR" >
                                                                    <observationMedia
classCode="OBS"  moodCode="EVN" >
                                                                        <id
root="1fe2cdd0-7aad-11db-9fe1-0800200c9a66" />

      <value>base64 encoded data</value>

      </observationMedia>
                                                            </entryRelationship>
                                                    </observation>
                                            </entryRelationship>
                                    </act>
                            </entry>
                    </section>
            </component>
            <!--


******************
Payers section
******************

The template identifier for the Payers section is
2.16.840.1.113883.10.20.1.9.
      Payers contains data on the patients payers, whether a third party
insurance,
      self-pay, other payer or guarantor, or some combination of payers, and
is used
      to define which entity is the responsible fiduciary for the financial
aspects
      of a patients care.

      Each unique instance of a payer and all the pertinent data needed to
contact,
      bill to, and collect from that payer should be included. Authorization
information
      that can be used to define pertinent referral, authorization tracking
number,
      procedure, therapy, intervention, device, or similar authorizations for
the patient
      or provider, or both should be included. At a minimum, the patients
pertinent current
      payment sources should be listed.

      The CCD represents the sources of payment as a coverage act, which
identifies all
      of the insurance policies or government or other programs that cover
some or all
      of the patient's healthcare expenses.  The policies or programs are
sequenced by
      order of preference.  Each policy or program identifies the covered
party with
      respect to the payer, so that the identifiers can be recorded.

-->
            <component>
```

```
                        <section>

                              <!-- Payers section template -->
                              <templateId root="2.16.840.1.113883.10.20.1.9"
/>

                              <!-- LOINC code for Payment Sources-->
                              <code code="48768-6"
codeSystem="2.16.840.1.113883.6.1" />

                              <title>Payers</title>

                              <!-- Empty Narrative explaining the purpose is
for machine readability -->
                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>


                              <entry>
                                    <act classCode="ACT"  moodCode="DEF" >
                                          <templateId
root="2.16.840.1.113883.10.20.1.20" />
                                          <id root="1fe2cdd0-7aad-11db-9fe1-
0800200c9a66" />

                                          <!-- LOINC code for Payment
Sources-->
                                          <code code="48768-6"
codeSystem="2.16.840.1.113883.6.1"  displayName="Payment sources" />
                                          <!-- Status is ALWAYS completed -->
                                          <statusCode code="completed" />
                                          <!-- POLICY relating to the
COVERAGE -->
                                          <entryRelationship typeCode="COMP"
>

                                                <!-- POLICY ACT -->
                                                <act classCode="ACT"
moodCode="EVN" >

                                                      <!-- Policy activity
template -->
                                                      <templateId
root="2.16.840.1.113883.10.20.1.26" />

                                                      <!--  POLICY TYPE
      Options can be selected with the following query on the RIM tables

      select * from VOC_nested_value_set where codeSystem =
'2.16.840.1.113883.5.4'
      and baseValueSetName like '%Insurance%'
       extended healthcare seems to be the most generic for basic coverage
      -->
                                                      <id root="3e676a50-
7aac-11db-9fe1-0800200c9a66" />
```

```
                                                    <code code="EHCPOL"
codeSystem="2.16.840.1.113883.5.4"  displayName="Extended healthcare" />
                                                    <!-- POLICY STATUS -->
                                                    <statusCode
code="completed" />

                                                    <!-- PERFORMER of the
POLICY -->
                                                    <performer
typeCode="PRF" >

                                                          <!-- ENTITY
ASSIGNED as PERFORMER of the POLICY -->
                                                          <assignedEntity>

                                                                <!--
Performer Identifier [ Payer ID when available]
     A payer in a policy activity SHALL contain one or more performer /
assignedEntity / id,
     to represent the payer identification number. For pharamacy benefit
programs this can be
     valued using the RxBIN and RxPCN numbers assigned by ANSI and NCPDP
respectively.
     When a nationally recognized payer identification number is available,
it would be placed here.
     If this information is not available, you can assign a GUID to the Payer
     and place it here.
-->
                                                                <id
root="329fcdf0-7ab3-11db-9fe1-0800200c9a66" />
                                                                <code
code="PAYOR"  displayName="Payor"  codeSystem="2.16.840.1.113883.5.110"
codeSystemName="RoleClass" />

                                                                <!--
Organization represented by the PERFORMER of the POLICY -->

      <representedOrganization>

      <name>Good Health Insurance</name>

      </representedOrganization>
                                                          </assignedEntity>
                                                    </performer>

                                                    <!-- PARTICIPANTS in
the POLICY ACT -->
                                                    <participant
typeCode="COV" >
                                                          <participantRole>

                                                                <!-- GUID
id for the participantRole -->
                                                                <id
root="14d4a520-7aae-11db-9fe1-0800200c9a66" />
                                                                <!-- Social
Security Number [ see the CCD final documentation for the root values ] -->
```

```
                                                                    <id
root="2.16.840.1.113883.4.1"  extension="123456789" />

                                                                    <!-- ROLE
of PARTICIPANT
     Select * from VOC_nested_value_set where codeSystem =
2.16.840.1.113883.5.111
     and baseValueSetName = roleCode and conceptName like %self%
     and nestedValueSetName = CoverageRoleType
-->
                                                                    <code
code="SELF"  codeSystem="2.16.840.1.113883.5.111"  displayName="Self" />

      </participantRole>
                                                          </participant>

                                                          <!-- Add this if you
want to include a specific authorization on this policy -->
                                                          <entryRelationship
typeCode="REFR" >
                                                                <!-- Described as
an ACT -->
                                                          <act
classCode="ACT"  moodCode="EVN" >
                                                                <!--
Authorization activity template -->
                                                                <templateId
root="2.16.840.1.113883.10.20.1.19" />
                                                                <!--
Assigned globally Unique ID for the Authorization -->
                                                                <id
root="f4dce790-8328-11db-9fe1-0800200c9a66" />
                                                                <code
nullFlavor="NA" />

      <entryRelationship typeCode="SUBJ" >

      <procedure classCode="PROC"  moodCode="PRMS" >

      <!-- SNOMED or CPT-4 (codeSystem 2.16.840.1.113883.6.12) -->

      <code code="27130"  codeSystem="2.16.840.1.113883.6.12"
displayName="Total hip replacement" />

      </procedure>

      </entryRelationship>
                                                                </act>
                                                          </entryRelationship>
                                                    </act>
                                               </entryRelationship>
                                          </act>
                                     </entry>
                                </section>
                           </component>
                           <!--
```

```
************************************
Advance Directives section
************************************
    This section contains data defining the patients advance directives and
any reference to supporting documentation.
            The most recent and up-to-date directives are required, if known,
and should be listed in as much detail as possible.

            This section contains data such as the existence of living wills,
healthcare proxies, and CPR and resuscitation status.
            If referenced documents are available, they can be included in
the CCD exchange package.

            NOTE: The descriptions in this section differentiate between
advance directives and advance directive documents.
            The former are the directions whereas the latter are legal
documents containing those directions.
            Thus, an advance directive might be no cardiopulmonary
resuscitation, and this directive might be stated
            in a legal advance directive document.
      -->
                  <!--
**********************************
Functional Status section
**********************************
  Functional Status describes the patients status of normal functioning at
the time the Care Record was created.

      Functional statuses include information regarding the patient relative
to:

      Ambulatory ability
      Mental status or competency
      Activities of Daily Living (ADLs), including bathing, dressing,
feeding, grooming
      Home / living situation having an effect on the health status of the
patient
      Ability to care for self
      Social activity, including issues with social cognition, participation
with friends and acquaintances other than family members
      Occupation activity, including activities partly or directly related to
working, housework or volunteering, family and home responsibilities or
activities related to home and family
      Communication ability, including issues with speech, writing or
cognition required for communication
      Perception, including sight, hearing, taste, skin sensation,
kinesthetic sense, proprioception, or balance
      -->
                  <!--
*************************
Problems section
*************************
  This section lists and describes all relevant clinical problems at the time
the summary is generated.
      At a minimum, all pertinent current and historical problems should be
listed.
```

```
      CDA R2 represents problems as Observations.

      CCD SHOULD contain exactly one and SHALL NOT contain more than one
Problem section
      (templateId 2.16.840.1.113883.10.20.1.11). The Problem section SHALL
contain a narrative block,
      and SHOULD contain clinical statements. Clinical statements SHOULD
include one or more problem acts
      (templateId 2.16.840.1.113883.10.20.1.27).

      A problem act SHOULD include one or more problem observations
(templateId 2.16.840.1.113883.10.20.1.28).
-->

                  <component>
                        <section>
                              <templateId root="2.16.840.1.113883.10.20.1.11"
/>

                              <!--  A problem is a clinical statement that a
clinician is particularly concerned about
      and wants to track. It has important patient management use cases (e.g.
health records often    present the problem list as a way of summarizing a
patient's medical history).
            -->

                              <!-- LOINC Problem List -->
                              <code code="11450-4"
codeSystem="2.16.840.1.113883.6.1" />
                              <title>Problems</title>

                              <!-- Empty Narrative explaining the purpose is
for machine readability -->
                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>
                              <entry>
                                    <!-- Problems are documented as
Observations inside of an Act container
                        CONF-146:         The value for Act / @classCode in a
problem act SHALL be ACT 2.16.840.1.113883.5.6 ActClass STATIC.
                        CONF-147:         The value for Act / @moodCode in a
problem act SHALL be EVN 2.16.840.1.113883.5.1001 ActMood STATIC.
            -->
                                    <act classCode="ACT"  moodCode="EVN" >
                                          <!-- Problem act template -->
                                          <templateId
root="2.16.840.1.113883.10.20.1.27" />
                                          <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                          <code nullFlavor="NA" />

                                          <!-- Add this if you want to
classify this as part of an Episode -->
                                          <entryRelationship typeCode="SUBJ"
>
```

```
                                                <!-- An episode observation
(templateId 2.16.840.1.113883.10.20.1.41) SHALL be represented with
Observation. -->
                                                <observation classCode="OBS"
moodCode="EVN" >
                                                      <templateId
root="2.16.840.1.113883.10.20.1.28" />
                                                      <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                      <!-- SNOMED shown -->
                                                      <code code="55607006"
codeSystem="2.16.840.1.113883.6.96" />
                                                      <text>
                                                            <reference
value="#problem-1"/>
                                                      </text>
                                                      <!-- Status MUST be
completed -->
                                                      <statusCode
code="completed" />
                                                      <effectiveTime>
                                                            <low value="1970"
/>
                                                      </effectiveTime>
                                                      <!-- SNOMED shown -->
                                                      <value xsi:type="CD"
code="12345"  codeSystem="2.16.840.1.113883.6.96"  displayName="Asthma" />
                                                      <!--

            ASTM CCR requires that all data objects have a stated source
            (or state explicitly that the source is unknown) so that any data
            within the summary can be validated. The source of data may be a
person,
organization, reference to some other data object, etc.

            In Q-TOOL, it can be the system or name of a person if you know
it.

            See the CCD-final.doc Sources section to see how to document as a
person.

                  -->

                                                      <informant>
                                                            <assignedEntity>
                                                                  <id
nullFlavor="NI" />
      <representedOrganization>
                                                                        <!--
Name of our system -->
      <name>EMR System Name</name>
      </representedOrganization>
```

```
                                                    </assignedEntity>
                                                </informant>

                                                <!-- Problem status
observation [ how to mark this problem observation as chronic ] -->
                                                <entryRelationship
typeCode="REFR" >
                                                    <observation
classCode="OBS"  moodCode="EVN" >
                                                        <!--
      The value for Observation / code in a status observation SHALL be
33999-4 Status 2.16.840.1.113883.6.1 LOINC STATIC
                                                -->

                                                        <code
code="33999-4"  codeSystem="2.16.840.1.113883.6.1"  displayName="Status" />
                                                        <!--
                    The value for Observation / statusCode in a status
observation SHALL be
                        completed  2.16.840.1.113883.5.14 ActStatus STATIC.

            -->

                                                        <statusCode
code="completed" />

                                                        <!-- this
is in SNOMED, we may need codes from ICD-9 (codeSystem =
2.16.840.1.113883.6.2 ) -->
                                                        <value
xsi:type="CE"  code="90734009"  codeSystem="2.16.840.1.113883.6.96"
displayName="Chronic" />

                                                        <informant>

      <assignedEntity>

      <id nullFlavor="NI" />

      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>

      </assignedEntity>

      </informant>
                                                    </observation>
                                                </entryRelationship>
                                                <entryRelationship
typeCode="SUBJ" >
                                                    <!-- Described as
an ACT -->
                                                    <act
classCode="ACT"  moodCode="EVN" >
                                                        <id
```

```
root="3e676a50-7aac-11db-9fe1-0800200c9a66" />
                                                                  <code
nullFlavor="NA" />
                                                                  <statusCode
code="completed" />
                                                                  <performer
typeCode="PRF" >
                                                                        <time
value="20071013" />
      <assignedEntity>
      <id root="2.16.840.1.113883.4.6"  extension="Doctor NPI" />
      <assignedPerson>
      <name>
            <prefix>Dr.</prefix>
            <given>Given Name</given>
            <family>Family Name</family>
      </name>
      </assignedPerson>
      <representedOrganization>
      <name>Some Clinic or Doctors Office Name</name>
      </representedOrganization>
      </assignedEntity>
      </performer>
                                                                  </act>
                                                            </entryRelationship>
                                                      </observation>
                                                </entryRelationship>
                                          </act>
                                    </entry>
                              </section>
                        </component>
                        <!--
*******************************
Family History section
*******************************
-->
                        <component>
                              <section>

                                    <!-- Family history section template -->
                                    <templateId root="2.16.840.1.113883.10.20.1.4"
/>
```

```
                              <!-- LOINC Family History code -->
                              <code code="10157-6"
codeSystem="2.16.840.1.113883.6.1" />
                              <title>Family history</title>

                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>

                              <entry>
                                    <organizer moodCode="EVN"
classCode="CLUSTER" >
                                          <!-- Family history organizer
template -->
                                          <templateId
root="2.16.840.1.113883.10.20.1.23" />
                                          <statusCode code="completed" />
                                          <subject>
                                                <relatedSubject
classCode="PRS" >
                                                      <!-- SNOMED shown -->
                                                      <code code="9947008"
codeSystem="2.16.840.1.113883.6.96"  displayName="Biological father" />
                                                      <subject>
                                                            <!-- From
VOC_nested_value_set in the most recent RIM Database -->

      <administrativeGenderCode code="M"  codeSystem="2.16.840.1.113883.5.1"
displayName="Male" />
                                                            <birthTime
value="1912" />
                                                      </subject>
                                                </relatedSubject>
                                          </subject>

                                          <!-- Family History Cause of Death
-->
                                          <component>
                                                <observation classCode="OBS"
moodCode="EVN" >
                                                      <!-- Family history
cause of death observation template -->
                                                      <templateId
root="2.16.840.1.113883.10.20.1.42" />
                                                      <id root="d42ebf70-
5c89-11db-b0de-0800200c9a66" />
                                                      <code code="ASSERTION"
codeSystem="2.16.840.1.113883.5.4" />
                                                      <statusCode
code="completed" />
                                                      <effectiveTime>
                                                            <low value="1979"
/>
                                                      </effectiveTime>
                                                      <!-- this is SNOMED -->
                                                      <value xsi:type="CD"
```

```
code="22298006"  codeSystem="2.16.840.1.113883.6.96"  displayName="MI" />
                                                      <informant>
                                                            <assignedEntity>
                                                                  <id
nullFlavor="NI" />
      <representedOrganization>
      <name>organization name</name>
      </representedOrganization>
                                                            </assignedEntity>
                                                      </informant>
                                                      <!-- New relationship
for the Cause -->
                                                      <entryRelationship
typeCode="CAUS" >
                                                            <observation
classCode="OBS"  moodCode="EVN" >
                                                                  <id
root="6898fae0-5c8a-11db-b0de-0800200c9a66" />
                                                                  <code
code="ASSERTION"  codeSystem="2.16.840.1.113883.5.4" />
                                                                  <statusCode
code="completed" />
                                                                  <!-- Put
the ICD9 code here and the associated coding scheme number [ this is SNOMED ]
-->
                                                                  <value
xsi:type="CD"  code="419099009"  codeSystem="2.16.840.1.113883.6.96"
displayName="Dead" />
                                                                  <informant>
      <assignedEntity>
      <id nullFlavor="NI" />
      <representedOrganization>
      <name>organization name</name>
      </representedOrganization>
      </assignedEntity>
      </informant>
                                                            </observation>
                                                      </entryRelationship>
                                                      <!-- Age Observation --
>
                                                      <entryRelationship
typeCode="SUBJ"  inversionInd="true" >
                                                            <observation
classCode="OBS"  moodCode="EVN" >
```

```
                                                                  <templateId
root="2.16.840.1.113883.10.20.1.38" />
                                                                  <code
code="397659008"  codeSystem="2.16.840.1.113883.6.96"  displayName="Age" />
                                                                  <statusCode
code="completed" />
      <effectiveTime>
                                                                        <low
value="1979" />
      </effectiveTime>
                                                                  <value
xsi:type="INT"  value="57" />
                                                                  <informant>
      <assignedEntity>
      <id nullFlavor="NI" />
      <representedOrganization>
      <name>organization name</name>
      </representedOrganization>
      </assignedEntity>
      </informant>
                                                                        </observation>
                                                                  </entryRelationship>
                                                            </observation>
                                                      </component>
                                                      <component>
                                                            <!-- Family history
observation template -->
                                                            <observation classCode="OBS"
moodCode="EVN" >
                                                                  <templateId
root="2.16.840.1.113883.10.20.1.22" />
                                                                  <id root="5bfe3ec0-
5c8b-11db-b0de-0800200c9a66" />
                                                                  <code code="ASSERTION"
codeSystem="2.16.840.1.113883.5.4" />
                                                                  <statusCode
code="completed" />
                                                                  <effectiveTime>
                                                                        <low value="1983"
/>
                                                                  </effectiveTime>
                                                                  <!-- this is SNOMED -->
                                                                  <value xsi:type="CD"
code="59621000"  codeSystem="2.16.840.1.113883.6.96"  displayName="HTN" />
                                                                  <informant>
                                                                        <assignedEntity>
                                                                        <id
nullFlavor="NI" />
```

```
      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>
                                                      </assignedEntity>
                                                </informant>
                                                <!-- Age observation
template -->
                                                <entryRelationship
typeCode="SUBJ" >
                                                      <observation
classCode="OBS"  moodCode="EVN" >
                                                            <templateId
root="2.16.840.1.113883.10.20.1.38" />
                                                            <code
code="397659008"  codeSystem="2.16.840.1.113883.6.96"  displayName="Age" />
                                                            <statusCode
code="completed" />

      <effectiveTime>
                                                                  <low
value="1983" />

      </effectiveTime>
                                                            <value
xsi:type="INT"  value="40" />
                                                      </observation>
                                                </entryRelationship>
                                          </observation>
                                    </component>
                              </organizer>
                        </entry>
                        <!-- Entry about the Mother -->
                        <entry typeCode="DRIV" >
                              <organizer moodCode="EVN"
classCode="CLUSTER" >
                                    <!-- Family history observation
template -->
                                    <templateId
root="2.16.840.1.113883.10.20.1.23" />
                                    <statusCode code="completed" />
                                    <subject>
                                          <relatedSubject
classCode="PRS" >
                                                <code code="65656005"
codeSystem="2.16.840.1.113883.6.96"  displayName="Biological mother" />
                                                <subject>

      <administrativeGenderCode code="F"  codeSystem="2.16.840.1.113883.5.1"
displayName="Female" />
                                                      <birthTime
value="1912" />
                                                </subject>
                                          </relatedSubject>
                                    </subject>
```

```
                                          <component>
                                                <observation classCode="OBS"
moodCode="EVN" >
                                                      <templateId
root="2.16.840.1.113883.10.20.1.22" />
                                                      <id root="a13c6160-
5c8b-11db-b0de-0800200c9a66" />
                                                      <code code="ASSERTION"
codeSystem="2.16.840.1.113883.5.4" />
                                                      <statusCode
code="completed" />
                                                      <effectiveTime>
                                                            <low value="1942"
/>
                                                      </effectiveTime>
                                                      <value xsi:type="CD"
code="195967001"  codeSystem="2.16.840.1.113883.6.96"  displayName="Asthma"
/>
                                                      <informant>
                                                            <assignedEntity>
                                                                  <id
nullFlavor="NI" />

      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>
                                                            </assignedEntity>
                                                      </informant>
                                                </observation>
                                          </component>
                                    </organizer>
                              </entry>
                        </section>
                  </component>
                  <!--
**************************
Social History section
**************************
-->
                  <component>
                        <section>
                              <!-- Social history section template -->
                              <templateId root="2.16.840.1.113883.10.20.1.15"
/>
                              <code code="29762-2"
codeSystem="2.16.840.1.113883.6.1" />
                              <title>Social History</title>

                              <!-- Empty Narrative explaining the purpose is
for machine readability -->
                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>
                              <!-- Narrative can be derived from the entry --
```

```
>
                              <entry>
                                    <observation classCode="OBS"
moodCode="EVN" >
                                          <!-- Social history observation
template -->
                                          <templateId
root="2.16.840.1.113883.10.20.1.33" />
                                          <id root="9b56c25d-9104-45ee-9fa4-
e0f3afaa01c1" />
                                          <!-- SNOMED -->
                                          <code code="230056004"
codeSystem="2.16.840.1.113883.6.96"  displayName="Cigarette smoking" />
                                          <statusCode code="completed" />
                                          <effectiveTime>
                                                <low value="1947" />
                                                <high value="1972" />
                                          </effectiveTime>
                                          <!-- if available -->
                                          <value xsi:type="ST" >1 pack per
day</value>
                                          <informant>
                                                <assignedEntity>
                                                      <id nullFlavor="NI" />

      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>
                                                </assignedEntity>
                                          </informant>
                                    </observation>
                              </entry>
                        </section>
                  </component>
                  <!--
***************************
Alerts section
***************************
-->
                  <component>
                        <section>
                              <!-- Alerts section template -->
                              <templateId root="2.16.840.1.113883.10.20.1.2"
/>
                              <code code="48765-2"
codeSystem="2.16.840.1.113883.6.1" />
                              <title>Allergies, Adverse Reactions,
Alerts</title>

                              <!-- Empty Narrative explaining the purpose is
for machine readability -->
                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>
```

```
                              <entry>
                                    <act classCode="ACT"  moodCode="EVN" >
                                          <!-- Problem act template -->
                                          <templateId
root="2.16.840.1.113883.10.20.1.27" />
                                          <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                          <code nullFlavor="NA" />
                                          <entryRelationship typeCode="SUBJ"
>
                                                <observation classCode="OBS"
moodCode="EVN" >

                                                      <!-- Alert observation
template -->
                                                      <templateId
root="2.16.840.1.113883.10.20.1.18" />
                                                      <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                      <code code="419511003"
codeSystem="2.16.840.1.113883.6.96" />
                                                      <statusCode
code="completed" />
                                                      <effectiveTime
value="20070101" />

                                                      <!-- SNOMED  -->
                                                      <value xsi:type="CE"
code="282100009"  codeSystem="2.16.840.1.113883.6.96"  displayName="Adverse
reaction to substance" />
                                                      <informant>
                                                            <assignedEntity>
                                                                  <id
nullFlavor="NI" />

      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>
                                                            </assignedEntity>
                                                      </informant>
                                                      <participant
typeCode="CSM" >
                                                            <participantRole
classCode="MANU" >

      <playingEntity classCode="MMAT" >

                                                                  <!--
Drug Entry - we will use FDB or RXNorm -->
                                                                  <code
code="70618"  codeSystem="2.16.840.1.113883.6.88"  displayName="Penicillin"
/>

      <name>Penicillin</name>
```

```
      </playingEntity>

      </participantRole>
                                                      </participant>
                                                </observation>
                                          </entryRelationship>
                                          <entryRelationship typeCode="MFST"
inversionInd="true" >
                                                <observation classCode="OBS"
moodCode="EVN" >

                                                      <!-- Allergy Reaction
observation template -->
                                                      <templateId
root="2.16.840.1.113883.10.20.1.54" />
                                                      <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                      <!-- Asserting a
problem -->
                                                      <code code="ASSERTION"
codeSystem="2.16.840.1.113883.5.4" />
                                                      <statusCode
code="completed" />

                                                      <!-- SNOMED -->
                                                      <value xsi:type="CE"
code="247472004"  codeSystem="2.16.840.1.113883.6.96"  displayName="Hives" />
                                                      <informant>
                                                            <assignedEntity>
                                                                  <id
nullFlavor="NI" />

      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>
                                                            </assignedEntity>
                                                      </informant>
                                                </observation>
                                          </entryRelationship>
                                          <entryRelationship typeCode="REFR"
>
                                                <observation classCode="OBS"
moodCode="EVN" >
                                                      <!-- Alert status
observation template -->
                                                      <templateId
root="2.16.840.1.113883.10.20.1.39" />
                                                      <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                      <code code="33999-4"
codeSystem="2.16.840.1.113883.6.1"  displayName="Status" />
                                                      <statusCode
code="completed" />
```

```
                                                      <!-- SNOMED -->
                                                      <value xsi:type="CE"
code="55561003"  codeSystem="2.16.840.1.113883.6.96"  displayName="Active" />
                                                      <informant>
                                                            <assignedEntity>
                                                                  <id
nullFlavor="NI" />

      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>
                                                            </assignedEntity>
                                                      </informant>
                                                </observation>
                                          </entryRelationship>
                                          <entryRelationship typeCode="RSON"
>
                                                <act classCode="ACT"
moodCode="EVN" >
                                                      <!-- History of medical
device use -->
                                                      <code code="46264-8"
codeSystem="2.16.840.1.113883.6.1"  displayName="Annotation comment" />
                                                      <text>
                                                            Your comments
here...
                                                      </text>
                                                </act>
                                          </entryRelationship>
                                    </act>
                              </entry>
                        </section>
                  </component>
                  <!--
***************************
Medications section
***************************
-->
                  <component>
                        <section>

                              <!-- Medications section template -->
                              <templateId root="2.16.840.1.113883.10.20.1.8"
/>
                              <code code="10160-0"
codeSystem="2.16.840.1.113883.6.1" />
                              <title>Medications</title>

                              <!-- Empty Narrative explaining the purpose is
for machine readability -->
                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>
                              <entry>
```

```
                                    <supply moodCode="EVN"  classCode="SPLY"
>
                                          <!-- Supply Information  -->
                                          <templateId
root="2.16.840.1.113883.10.20.1.34" />
                                          <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                          <statusCode code="completed" />
                                          <effectiveTime value="20071014" />
                                          <repeatNumber xsi:type="IVL_INT"
value="2" />
                                          <quantity xsi:type="PQ"  value="30"
/>
                                          <author>
                                                <time value="20071013" />
                                                <assignedAuthor>
                                                      <id
root="2.16.840.1.113883.4.6"  extension="1234567890" />
                                                      <assignedPerson>
                                                            <name>person
name</name>
                                                      </assignedPerson>
                                                </assignedAuthor>
                                          </author>
                                          <!--

                                                ASTM CCR requires that
all data objects have a stated source
                                                (or state explicitly
that the source is unknown) so that any data
                                                within the summary can
be validated. The source of data may be a person,
                                                organization, reference
to some other data object, etc.

            Here it can also be the system or name of a person if you know
it.

                  See the CCD-final.doc Sources section for how to document
informant as a person.
                                                                  -->

                                          <informant>
                                                <assignedEntity>
                                                      <id nullFlavor="NI" />

      <representedOrganization>
                                                            <!-- Name of our
system -->
                                                            <name>EMR System
name</name>

      </representedOrganization>
                                                </assignedEntity>
                                          </informant>
                                          <!-- Pharmacy Location -->
                                          <participant typeCode="LOC" >
```

```
                                                <participantRole>
                                                      <!-- You can provide
the NPI or a GUID that you assign here [ if GUID, make it the root ] -->
                                                      <id
root="2.16.840.1.113883.4.6"  extension="Pharmacy NPI" />
                                                      <!-- The Street Address
-->
                                                      <addr>

      <streetAddressLine>
                                                                  Address
Line 1

      </streetAddressLine>

      <streetAddressLine>
                                                                  Address
Line 2

      </streetAddressLine>
                                                            <city>City</city>

      <county>County</county>

      <state>State</state>

      <country>Country</country>

      <postalCode>123456</postalCode>
                                                      </addr>
                                                </participantRole>
                                          </participant>
                                    </supply>
                              </entry>

                              <entry>
                                    <substanceAdministration
classCode="SBADM"  moodCode="EVN" >
                                          <!-- Medication activity template -
->
                                          <templateId
root="2.16.840.1.113883.10.20.1.24" />
                                          <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                          <!-- completed if no longer active,
active if ongoing. -->
                                          <statusCode code="completed" />
                                          <!--
      CONF-308:   A medication activity SHOULD contain one or more
SubstanceAdministration / effectiveTime elements, used to indicate the actual
or intended start and stop date of a medication, and the frequency of
administration.
                              -->

                                          <effectiveTime xsi:type="IVL_TS" >
                                                <!-- indicates the START DATE
of the medication and is set to the date filled as closest known date.
```

```
                                    -->

                                          <low value="20071014" />
                                          <!-- the DAYS SUPPLY -->
                                          <width value="30" />
                                    </effectiveTime>
                                    <!--  operator "A" [ SetOperator
(intersect) ] says to treat the two effective dates as a set
                  where they intersect on the starting date. The frequency is
every 6 hours as shown. -->
                                    <effectiveTime xsi:type="PIVL_TS"
institutionSpecified="true"  operator="A" >
                                          <period value="6"  unit="h"
/>
                                    </effectiveTime>
                                    <!--a medication activity can be
selected from the HL7 RouteOfAdministration (2.16.840.1.113883.5.112) code
system or the example below -->
                                    <routeCode code="IPINHL"
codeSystem="2.16.840.1.113883.3.26.1.1"  codeSystemName="NCI Thesaurus"
displayName="ORAL" />
                                    <doseQuantity value="2" />

                                    <consumable>
                                          <manufacturedProduct>
                                                <!-- Product template -
->
                                                <templateId
root="2.16.840.1.113883.10.20.1.53" />
                                                <manufacturedMaterial>

                                                      <!-- RX NORM -->
                                                      <code
code="307782"  codeSystem="2.16.840.1.113883.6.88"  displayName="Albuterol
0.09 MG/ACTUAT inhalant solution" >
                                                            <!-- A
manufacturedMaterial in a product template SHALL contain exactly one Material
/ code / originalText,
                   which represents the generic name of the product.
                  -->

      <originalText>Albuterol inhalant</originalText>
                                                      </code>
                                                </manufacturedMaterial>
                                          </manufacturedProduct>
                                    </consumable>

                                    <informant>
                                          <assignedEntity>
                                                <id nullFlavor="NI" />

      <representedOrganization>
                                                      <!-- Name of our
system -->
                                                      <name>EMR System
name</name>
```

```
      </representedOrganization>
                                                      </assignedEntity>
                                                </informant>
                                                <!-- LOINC Code -->
                                                <entryRelationship typeCode="RSON"
>
                                                      <act classCode="ACT"
moodCode="EVN" >
                                                            <code code="46264-8"
codeSystem="2.16.840.1.113883.6.1"  displayName="Annotation comment" />
                                                            <text>
                                                                  Your comments
here...
                                                            </text>
                                                      </act>
                                                </entryRelationship>

                                                <!-- A medication activity MAY
contain one or more SubstanceAdministration / precondition / criterion,
                        to indicate that the medication is administered only
when the associated (coded or free text) criteria are met.
                        NOTE: this is NOT a diagnosis.
                  -->
                                                <precondition typeCode="PRCN" >
                                                      <criterion>
                                                            <code code="ASSERTION"
codeSystem="2.16.840.1.113883.5.4" />
                                                            <!-- SNOMED -->
                                                            <value xsi:type="CE"
code="56018004"  codeSystem="2.16.840.1.113883.6.96"  displayName="Wheezing"
/>
                                                      </criterion>
                                                </precondition>
                                          </substanceAdministration>
                                    </entry>
                              </section>
                  </component>
                  <!--
*********************************
Medical Equipment section
*********************************
-->
                  <!--
*****************************
Immunizations section
*****************************
-->
                  <component>
                        <section>
                              <!-- Immunizations section template -->
                              <templateId root="2.16.840.1.113883.10.20.1.6"
/>
                              <code code="11369-6"
codeSystem="2.16.840.1.113883.6.1" />
                              <title>Immunizations</title>
                              <!-- Empty Narrative explaining the purpose is
for machine readability -->
```

```
                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>

                              <entry>
                                    <substanceAdministration
classCode="SBADM"  moodCode="EVN"  negationInd="false" >
                                          <!-- Medication activity template -
->
                                          <templateId
root="2.16.840.1.113883.10.20.1.24" />
                                          <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                          <code code="12345"
codeSystem="2.16.840.1.113883.6.12" />
                                          <statusCode code="completed" />
                                          <!-- When given -->
                                          <effectiveTime xsi:type="IVL_TS" >
                                                <center value="199911" />
                                          </effectiveTime>

                                          <!-- How adminstered -->
                                          <routeCode code="IM"
codeSystem="2.16.840.1.113883.5.112"  codeSystemName="RouteOfAdministration"
displayName="Intramuscular injection" />
                                          <doseQuantity value="2" />
                                          <consumable>
                                                <manufacturedProduct>

                                                      <!-- Product template -
->
                                                      <templateId
root="2.16.840.1.113883.10.20.1.53" />
                                                      <manufacturedMaterial>
                                                            <code code="88"
codeSystem="2.16.840.1.113883.6.59"  displayName="Influenza virus vaccine" >

      <originalText>Influenza virus vaccine</originalText>
                                                            </code>
                                                      </manufacturedMaterial>
                                                </manufacturedProduct>
                                          </consumable>

                                          <informant>
                                                <assignedEntity>
                                                      <id nullFlavor="NI" />

      <representedOrganization>

      <name>organization name</name>

      </representedOrganization>
                                                </assignedEntity>
                                          </informant>

                                          <entryRelationship typeCode="RSON"
```

```
>
                                                <act classCode="ACT"
moodCode="EVN" >
                                                      <code code="46264-8"
codeSystem="2.16.840.1.113883.6.1"  displayName="Annotation comment" />
                                                      <text>
                                                            Your comments
here...
                                                      </text>
                                                </act>
                                          </entryRelationship>
                                          <!-- An immunization activity MAY
contain one or more SubstanceAdministration / precondition / criterion,
                        to indicate that the medication is administered only
when the associated (coded or free text) criteria are met.
                        NOTE: this is NOT a diagnosis.
                  -->
                                          <precondition typeCode="PRCN" >
                                                <criterion>
                                                      <code code="ASSERTION"
codeSystem="2.16.840.1.113883.5.4" />
                                                      <value xsi:type="CE"
code="12345"  codeSystem="2.16.840.1.113883.6.104" />
                                                </criterion>
                                          </precondition>
                                    </substanceAdministration>
                              </entry>
                        </section>
                  </component>
                  <!--
*****************************
Vital Signs section
*****************************
-->
                  <component>
                        <section>
                              <!-- Vital signs section template -->
                              <templateId root="2.16.840.1.113883.10.20.1.16"
/>
                              <code code="8716-3"
codeSystem="2.16.840.1.113883.6.1" />
                              <title>Vital Signs</title>

                              <!-- Empty Narrative explaining the purpose is
for machine readability -->
                              <text>
                                    <paragraph>All data is contained in the
clinical statements</paragraph>
                              </text>

                              <entry>
                                    <organizer classCode="CLUSTER"
moodCode="EVN" >
                                          <!-- Vital signs organizer template
-->
                                          <templateId
root="2.16.840.1.113883.10.20.1.35" />
```

```
                                    <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                    <!-- SNOMED -->
                                    <code code="46680005"
codeSystem="2.16.840.1.113883.6.96"  displayName="Vital signs" />
                                    <!-- MUST be completed -->
                                    <statusCode code="completed" />
                                    <!-- When taken -->
                                    <effectiveTime value="19991114" />

                                    <component>
                                          <observation classCode="OBS"
moodCode="EVN" >
                                                <!-- Result observation
template -->
                                                <templateId
root="2.16.840.1.113883.10.20.1.31" />
                                                <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                <!-- SNOMED -->
                                                <code code="50373000"
codeSystem="2.16.840.1.113883.6.96"  displayName="Body height" />
                                                <!-- MUST be completed
-->
                                                <statusCode
code="completed" />
                                                <!-- Time Taken -->
                                                <effectiveTime
value="19991114" />
                                                <!-- The PQ type [ A
dimensioned quantity expressing the result of a measurement act. ]

                              Units :
                                    The unit of measure specified in the
Unified Code for Units of Measure (UCUM)
                                    [http://aurora.rg.iupui.edu/UCUM].
                                    -->
                                                <value xsi:type="PQ"
value="177"  unit="cm" />
                                                <interpretationCode
code="N"  codeSystem="2.16.840.1.113883.5.83" />
                                                <!--

      ASTM CCR requires that all data objects have a stated source (or state
explicitly that the source is unknown) so that any data within the summary
can be validated. The source of data may be a person, organization, reference
to some other data object, etc.

             Here it can also be the system or name of a person if you know
it.

              See the CCD-final.doc Sources section for how to document
informant as a person.
                                    -->
                                                <informant>
                                                      <assignedEntity>
                                                            <id
```

```
nullFlavor="NI" />

      <representedOrganization>
                                                                  <!--
Name of EMR System -->

      <name>EMR System name</name>

      </representedOrganization>
                                                        </assignedEntity>
                                                  </informant>

                                                  <entryRelationship
typeCode="RSON" >
                                                        <act
classCode="ACT"  moodCode="EVN" >
                                                              <code
code="46264-8"  codeSystem="2.16.840.1.113883.6.1"  displayName="Annotation
comment" />
                                                              <text>
                                                                    Your
comments here...
                                                              </text>
                                                        </act>
                                                  </entryRelationship>
                                                  <referenceRange>

      <observationRange>
                                                              <text>M
130-190 cm; F 120-160 cm</text>

      </observationRange>
                                                  </referenceRange>
                                            </observation>
                                      </component>
                                </organizer>
                          </entry>
                    </section>
               </component>
               <!--
*************************
Results section
*************************
-->
               <component>
                    <section>
                          <templateId root="2.16.840.1.113883.10.20.1.14"
/>
                          <!-- Results section template -->
                          <code code="30954-2"
codeSystem="2.16.840.1.113883.6.1" />
                          <title>Results</title>
                          <!-- Empty Narrative explaining the purpose is
for machine readability -->
                          <text>
                                <paragraph>All data is contained in the
clinical statements</paragraph>
```

```
                              </text>

                              <entry>
                                    <organizer classCode="BATTERY"
moodCode="EVN" >
                                          <!-- Result organizer template -->
                                          <templateId
root="2.16.840.1.113883.10.20.1.32" />
                                          <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                          <!-- SNOMED [ look for an
equivalent ] -->
                                          <code code="43789009"
codeSystem="2.16.840.1.113883.6.96"  displayName="CBC WO DIFFERENTIAL" />
                                          <!-- MUST be completed -->
                                          <statusCode code="completed" />
                                          <!-- When tested -->
                                          <effectiveTime value="200003231430"
/>
                                          <component>
                                                <observation classCode="OBS"
moodCode="EVN" >
                                                      <!-- Result observation
template -->
                                                      <templateId
root="2.16.840.1.113883.10.20.1.31" />
                                                      <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                      <!-- LOINC -->
                                                      <code code="30313-1"
codeSystem="2.16.840.1.113883.6.1"  displayName="HGB" />
                                                      <!-- MUST be completed
-->
                                                      <statusCode
code="completed" />
                                                      <!-- When tested -->
                                                      <effectiveTime
value="200003231430" />
                                                      <!-- The PQ type [ A
dimensioned quantity expressing the result of a measurement act. ]

                                    Units : The unit of measure specified in
the Unified Code for Units of Measure (UCUM)
[http://aurora.rg.iupui.edu/UCUM].
                                          -->
                                                      <value xsi:type="PQ"
value="13.2"  unit="g/dl" />
                                                      <!-- A result
observation SHOULD contain exactly one Observation / interpretationCode,
                        which can be used to provide a rough qualitative
interpretation of the observation,
                        such as N (normal), L (low), S (susceptible), etc.
                        Interpretation is generally provided for numeric results
where an interpretation range
                        has been defined, or for antimicrobial susceptibility test
interpretation.
                  -->
```

```
                                                <interpretationCode
code="N"  codeSystem="2.16.840.1.113883.5.83" />
                                                <informant>
                                                      <assignedEntity>
                                                            <id
nullFlavor="NI" />
      <representedOrganization>
                                                                  <!--
Name of EMR System -->
      <name>EMR System name</name>
      </representedOrganization>
                                                      </assignedEntity>
                                                </informant>
                                                <!-- A result
observation SHOULD contain one or more Observation / referenceRange
                  to show the normal range of values for the observation
result.
              -->
                                                <referenceRange>
      <observationRange>
                                                            <text>M 13-
18 g/dl; F 12-16 g/dl</text>
      </observationRange>
                                                </referenceRange>
                                          </observation>
                                    </component>
                                    <component>

                                          <observation classCode="OBS"
moodCode="EVN" >
                                                <!-- Result observation
template -->
                                                <templateId
root="2.16.840.1.113883.10.20.1.31" />
                                                <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                <!-- LOINC -->
                                                <code code="33765-9"
codeSystem="2.16.840.1.113883.6.1"  displayName="WBC" />
                                                <!-- MUST be completed
-->
                                                <statusCode
code="completed" />
                                                <!-- When tested [ to
the minute ] -->
                                                <effectiveTime
value="200003231430" />

                                                <!-- The PQ type [ A
dimensioned quantity expressing the result of a measurement act. ]

      Units : The unit of measure specified in the Unified Code for Units of
```

```
Measure (UCUM) [http://aurora.rg.iupui.edu/UCUM]. -->
                                                <value xsi:type="PQ"
value="6.7"  unit="10+3/ul" />
                                                <!-- A result
observation SHOULD contain exactly one Observation / interpretationCode,
which can be used to provide a rough qualitative interpretation of the
observation,  such as N (normal), L (low), S (susceptible), etc.
                  Interpretation is generally provided for numeric results
where an interpretation range has been defined, or for antimicrobial
susceptibility test interpretation. -->
                                                <interpretationCode
code="N"  codeSystem="2.16.840.1.113883.5.83" />
                                                <informant>
                                                      <assignedEntity>
                                                            <id
nullFlavor="NI" />

      <representedOrganization>
                                                                  <!--
Name of EMR System -->

      <name>EMR System name</name>

      </representedOrganization>
                                                      </assignedEntity>
                                                </informant>

                                                <!-- A result
observation SHOULD contain one or more Observation / referenceRange
                  to show the normal range of values for the observation
result.
              -->
                                                <referenceRange>

      <observationRange>
                                                      <!-- Used
to express values having a LOW, HIGH and WIDTH where the width is
      the difference between the high and low boundary. The purpose of
distinguishing a width property is to handle all cases of incomplete
information symmetrically.
            In any interval representation, only two of the three properties
high, low, and width need to be stated and the third can be derived.
            Units : The unit of measure specified in the Unified Code for
Units of Measure (UCUM) [http://aurora.rg.iupui.edu/UCUM].  -->
                                                      <value
xsi:type="IVL_PQ" >
                                                            <low
value="4.3"  unit="10+3/ul" />
                                                            <high
value="10.8"  unit="10+3/ul" />
                                                      </value>

      </observationRange>
                                                <referenceRange>
                                          </observation>
                                    </component>
                              </organizer>
```

```
                        </entry>
                  </section>
            </component>
            <!--
**************************
Procedures section
**************************
-->
            <component>
                  <section>
                        <templateId root="2.16.840.1.113883.10.20.1.12"
/>

                        <!-- Procedures section template -->
                        <code code="47519-4"
codeSystem="2.16.840.1.113883.6.1" />
                        <title>Procedures</title>

                        <!-- Empty Narrative explaining the purpose is
for machine readability -->
                        <text>
                              <paragraph>All data is contained in the
clinical statements</paragraph>
                        </text>

                        <entry>
                              <procedure classCode="PROC"
moodCode="EVN" >
                                    <!-- Procedure activity template --
>
                                    <templateId
root="2.16.840.1.113883.10.20.1.29" />
                                    <id root="db734647-fc99-424c-a864-
7e3cda82e703" />

                                    <!-- The value for [Act |
Observation | Procedure] / code in a procedure activity
            SHOULD be selected from LOINC (codeSystem
2.16.840.1.113883.6.1)
            or SNOMED CT (codeSystem 2.16.840.1.113883.6.96),
            and MAY be selected from CPT-4 (codeSystem
2.16.840.1.113883.6.12),
            ICD9 Procedures (codeSystem 2.16.840.1.113883.6.104),
            ICD10 Procedure Coding System (codeSystem
2.16.840.1.113883.6.4).
          -->
                                    <code code="27130"
codeSystem="2.16.840.1.113883.6.12"  displayName="Total hip replacement" >
                                          <qualifier>
                                                <name code="LT"
displayName="Left Side" />
                                          </qualifier>
                                    </code>
                                    <!-- MUST be completed -->
                                    <statusCode code="completed" />
                                    <!-- Date of the procedure -->
                                    <effectiveTime value="19980105" />
```

```
                                    <informant>
                                          <assignedEntity>
                                                <id nullFlavor="NI" />

      <representedOrganization>
                                                      <!-- Name of EMR
System -->
                                                      <name>EMR System
name</name>

      </representedOrganization>
                                          </assignedEntity>
                                    </informant>

                                    <!-- Documenting the Manufacturer
of the Device [ Minimally ]
                        You can elucidate further by adding additional
participant information
                        on the manufacturer, like address and so on if required.
                    -->
                                    <participant typeCode="DEV" >
                                          <participantRole
classCode="MANU" >
                                                <!-- Product instance
template -->
                                                <templateId
root="2.16.840.1.113883.10.20.1.52" />
                                          </participantRole>
                                    </participant>

                                    <!-- Documenting the Hospital
Location -->
                                    <participant typeCode="LOC" >
                                          <!-- Location participation
template -->
                                          <templateId
root="2.16.840.1.113883.10.20.1.45" />
                                          <!-- Documenting the ID and (
Service Delivery Location ) of the Hospital -->
                                          <participantRole
classCode="SDLOC" >
                                                <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                <!-- Address of the
Hospital -->
                                                <addr use="PUB" >

      <streetAddressLine>
                                                            Address
Line 1
      </streetAddressLine>

      <streetAddressLine>
                                                            Address
Line 2
```

```
      </streetAddressLine>
                                                        <city>City</city>

      <county>County</county>

      <state>State</state>

      <country>Country</country>

      <postalCode>123456</postalCode>
                                                  </addr>
                                                  <playingEntity
classCode="PLC" >
                                                        <name>Mercy
Medical</name>
                                                  </playingEntity>
                                            </participantRole>
                                      </participant>

                                      <entryRelationship typeCode="RSON"
>
                                            <act classCode="ACT"
moodCode="EVN" >
                                                  <code code="46264-8"
codeSystem="2.16.840.1.113883.6.1"  displayName="Annotation comment" />
                                                  <text>
                                                        Your comments
here...
                                                  </text>
                                            </act>
                                      </entryRelationship>

                                      <entryRelationship typeCode="SUBJ"
>
                                            <act classCode="ACT"
moodCode="EVN" >
                                                  <id root="3e676a50-
7aac-11db-9fe1-0800200c9a66" />
                                                  <code nullFlavor="NA"
/>
                                                  <statusCode
code="completed" />
                                                  <!-- Documenting the
Performer of the Procedure -->
                                                  <performer
typeCode="PRF" >
                                                        <time
value="20071013" />
                                                        <assignedEntity>
                                                              <!-- root =
NPI values, extension = actual NPI -->
                                                              <id
root="2.16.840.1.113883.4.6"  extension="Doctor NPI" />
                                                              <!-- Fill
in the name values from the database -->
      <assignedPerson>
```

```
      <name>

      <prefix>Dr.</prefix>

      <given>Given Name</given>

      <family>Family Name</family>

      </name>

      </assignedPerson>

      <representedOrganization>

      <name>Some Clinic or Doctors Office Name</name>

      </representedOrganization>
                                                                  </assignedEntity>
                                                            </performer>
                                                      </act>
                                                </entryRelationship>
                                          </procedure>
                                    </entry>
                              </section>
                        </component>
                        <!--
**************************
Encounters section
**************************
-->
                        <component>
                              <section>
                                    <templateId root="2.16.840.1.113883.10.20.1.3"
/>
                                    <!-- Encounters section template -->
                                    <code code="46240-8"
codeSystem="2.16.840.1.113883.6.1" />
                                    <title>Encounters</title>
                                    <!-- Empty Narrative explaining the purpose is
for machine readability -->
                                    <text>
                                          <paragraph>All data is contained in the
clinical statements</paragraph>
                                    </text>

                                    <entry>
                                          <encounter classCode="ENC"
moodCode="EVN" >
                                                <!-- Encounter activity template --
>
                                                <templateId
root="2.16.840.1.113883.10.20.1.21" />
                                                <id root="db734647-fc99-424c-a864-
7e3cda82e703" />
                                                <!-- The value for Encounter / code
in an encounter activity SHOULD be selected from ValueSet
```

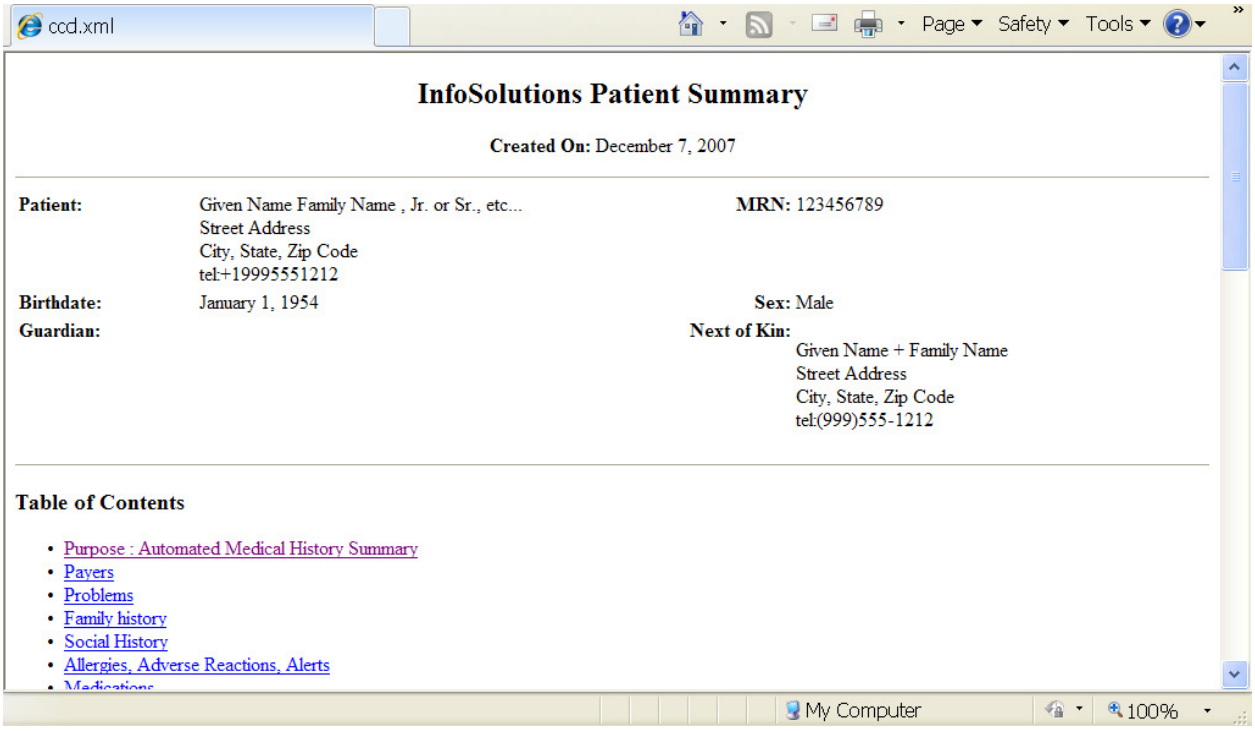
```
                    2.16.840.1.113883.1.11.13955 EncounterCode
2.16.840.1.113883.5.4 ActCode DYNAMIC.
                -->
                                        <code code="GENRL"
codeSystem="2.16.840.1.113883.5.4"  displayName="General" >
                                        <originalText>
                                              Checkup Examination
                                              <reference
value="#encounter-1" />
                                        </originalText>
                                        </code>
                                        <!-- Date of Encounter [ add the
Hours + minutes + secs if you have it and the offset from GMT ]-->
                                        <effectiveTime
value="20070407130000+0500" />
                                        <!-- For a Hospital, you might show
an admit and discharge date like so...
                    effectiveTime
                    low value = "20070407130000+0500"
                    high value = "20070409130000+0500"
                    effectiveTime
                -->
                                        <informant>
                                              <assignedEntity>
                                              <id nullFlavor="NI" />

      <representedOrganization>
                                                    <!-- Name of EMR
System -->
                                                    <name>EMR System
name</name>

      </representedOrganization>
                                              </assignedEntity>
                                        </informant>
                                        <!-- Location of Office -->
                                        <participant typeCode="LOC" >
                                              <!-- Location participation
template -->
                                              <templateId
root="2.16.840.1.113883.10.20.1.45" />
                                              <!-- Service Delivery
Location -->
                                              <participantRole
classCode="SDLOC" >
                                                    <id root="db734647-
fc99-424c-a864-7e3cda82e703" />
                                                    <playingEntity
classCode="PLC" >
                                                          <name>Good Health
Clinic</name>
                                                    </playingEntity>
                                              </participantRole>
                                        </participant>

                                        <entryRelationship typeCode="RSON"
>
```

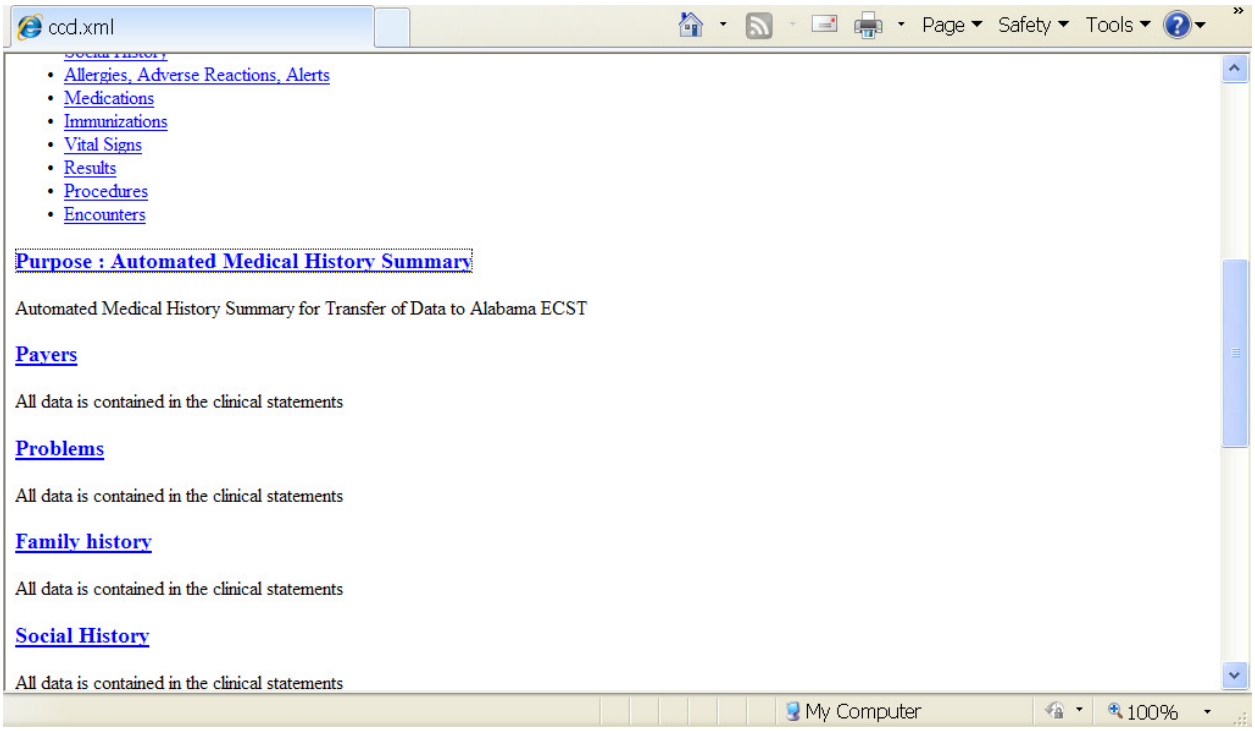
```
                                        <act classCode="ACT"
moodCode="EVN" >
                                              <id root="3e676a50-
7aac-11db-9fe1-0800200c9a66" />
                                              <code nullFlavor="NA"
/>
                                              <statusCode
code="completed" />
                                              <!-- Documenting the
Performer of the Exam -->
                                              <performer
typeCode="PRF" >
                                                    <time
value="20071013" />
                                                    <assignedEntity>
                                                          <!-- ( look
in RIM tables VCS_code_system, VOC_value_set, and VOC_nested_value_set for
NPI system ) -->
                                                    <id
root="2.16.840.1.113883.4.6"  extension="Doctor NPI" />
                                                    <!-- Fill
in the name values from the database -->

      <assignedPerson>

      <name>

      <prefix>Dr.</prefix>

      <given>Given Name</given>

      <family>Family Name</family>

      </name>

      </assignedPerson>

      <representedOrganization>

      <name>Some Clinic or Doctors Office Name</name>

      </representedOrganization>
                                                    </assignedEntity>
                                              </performer>

                                        </act>
                                  </entryRelationship>
                                  <entryRelationship typeCode="RSON"
>
                                        <act classCode="ACT"
moodCode="EVN" >
                                              <code code="46264-8"
codeSystem="2.16.840.1.113883.6.1"  displayName="Annotation comment" />
                                              <text>
                                                    Your comments
here...
                                              </text>
```

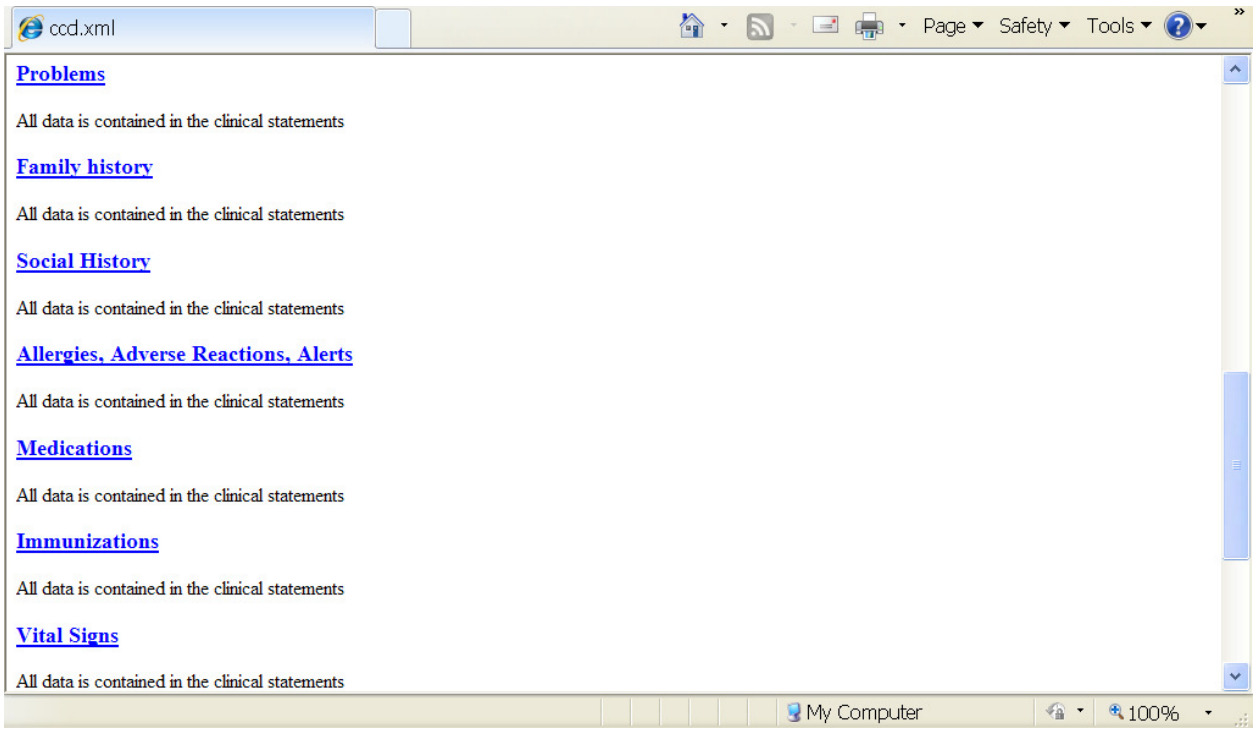
```
                                        </act>
                                    </entryRelationship>
                                </encounter>
                            </entry>
                        </section>
                    </component>
                    <!--
*****************************
Plan of Care section
*****************************
-->
            </structuredBody>
        </component>
</ClinicalDocument>
```

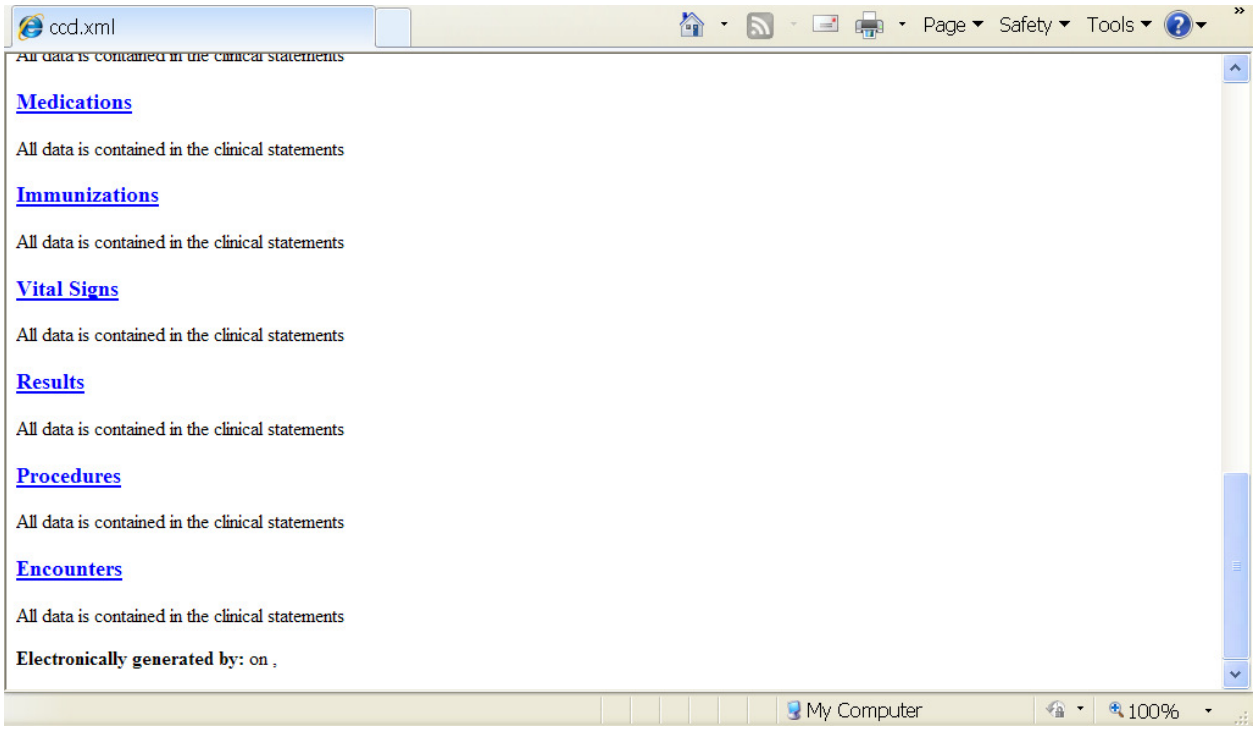
Appendix B - Sample Portion of a Viewable Document

The following is a portion of the CCD Viewable in any Web Browser. The Standard Template provides for a Table of Contents with Links to the various sections of the Document.






ccd.xml
Page
Safety
Tools
Problems
All data is contained in the clinical statements
Family history
All data is contained in the clinical statements
Social History
All data is contained in the clinical statements
Allergies, Adverse Reactions, Alerts
All data is contained in the clinical statements
Medications
All data is contained in the clinical statements
Immunizations
All data is contained in the clinical statements
Vital Signs
All data is contained in the clinical statements
My Computer
100%


ccd.xml
Page
Safety
Tools
Medications
All data is contained in the clinical statements
Immunizations
All data is contained in the clinical statements
Vital Signs
All data is contained in the clinical statements
Results
All data is contained in the clinical statements
Procedures
All data is contained in the clinical statements
Encounters
All data is contained in the clinical statements
Electronically generated by: on ,
My Computer
100%

Appendix C – Common OID Values

The following tables provide a listing of commonly referenced object identifier (OID) values. The complete list may be downloaded from HL7 OID registry at http://www.hl7.org/oid/frames.cfm.

Table C-1 – Identifier Values

OID	Common Name	Description
2.16.840.1.113883.4.1	SSN / Social Security Number	United States Social Security Number assigned by the U.S. Social Security Administration
2.16.840.1.113883.4.6	NPI / National Provider Identifier	National Provider Identifier assigned by HHS National Plan and Provider Enumeration System. https://nppes.cms.hhs.gov/NPPES/Welcome.do
2.16.840.1.113883.4.3.21	Kentucky Drivers License	Kentucky Motor Vehicle Bureau
2.16.840.1.113883.4.61.21	Kentucky State Provider License Number	Company identifier for Blue Cross Blue Shield of Kentucky
2.16.840.1.113883.4.290.21	Kentucky Medicaid Identifier	Generic OID for Medicaid ID Number
2.16.840.1.113883.3.147	ACS Inc	Affiliated Computer Services, Sending/Receiving System
2.16.840.1.113883.13.24	ACS Clinical Alert	OID used to provide information about actionable items or health recommendations

Table C-2 – Code Systems

OID	Common Name	Description
2.16.840.1.11338.6.96	SNOMED CT	Systematized Nomenclature of Medicine. Standard clinical terms developed by the College of American Pathologists and adopted as a component of the Unified Medical Language System of the national Library of Medicine. http://www.nlm.nih.gov/research/umls/Snomed/snomed_main.html
2.16.840.1.113883.6.103	ICD9CM Diagnosis Codes	International Classification of Diseases 9th ed. Diagnosis Codes (Volumes I & II)
2.16.840.1.113883.6.104	ICD9CM Procedure Codes	International Classification of Diseases 9th ed. Procedure Codes (Volumes III)
2.16.840.1.113883.6.1	LOINC / LN	Logical Observation Identifier names and Codes published by the Regenstreif Institute and adopted as a component of the Unified Medical Language System of the national Library of Medicine. http://www.nlm.nih.gov/research/umls/loinc_main.html
2.16.840.1.113883.6.12	C4, CPT	American Medical Association " Current Procedure Terminology 4 (CPT4 Codes)
2.16.840.1.113883.3.47	HCPCS	Healthcare Common Procedure Coding System (HCPCS) Level II Alphanumeric codes. The HCPCS code system is used in the US for reimbursement of Medicare and other health insurance program claims. Level II of the HCPCS consists of codes that identify products, supplies, and services not included in the CPT codes (HCPCS Level I). Level II alphanumeric codes are maintained by the Centers for Medicare and Medicaid Services (CMS). Level II alphanumeric codes do not contain codes from the Current Dental Terminology (CDT) system, which is maintained by the American Dental Association (ADA).
2.16.840.1.113883.6.69	NDC	National Drug Codes assigned by the Food and Drug Administration. http://www.fda.gov/cder/ndc/
2.16.840.1.113883.6.8	Units, UCUM	Unified Code for Units of Measure available at http://www.hl7.de/download/documents/ucum/ucum.html or http://www.regenstrief.org/medinformatics/ucum/downloads
2.16.840.1.113883.13.24	Clinical Alerts	OID to be used in conjunction with HL7 ClinicalActionDetectedIssue (OID Suffix .11.17814) Codes associated with this external OID will provide the detail for standard patient specific clinical messages generated by ACS electronic clinical support tool.

Table C-3 : OID Reference to HL7 V2.x and RIM211 Table Values

OID	Common Name	Description
2.16.840.1.113883.12.127	Allergen Type	HL7 version 2.x Allergen type used in chapter(s) 3; HL7 table 0127
2.16.840.1.113883.12.128	Allergy Severity	HL7 version 2.x Allergy severity used in chapter(s) 3; HL7 table 0128
2.16.840.1.113883.5.1	Administrative Gender (v3 HL7RIM 211)	Replaces Administrative Sex v2.x Table 001 (OID 2.16.840.1.113883.12.1)
2.16.840.1.113883.6.92	State Code (v3 HL7 RIM 211)	FIPSPUB-2 – Codes for the identification of States, District of Columbia and Outlying areas of the United States.
2.16.840.1.113883.6.93	County Codes	FIPSPUB6-4 - Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas, version 1990 August 31. Replaces HL7 User-defined Table 0289 – County/parish (2.16.840.1.113883.12.289)
2.16.840.1.113883.5.104	Race Code (HL7 v3 RIM211) Matches 2.16.840.1.113883.6.238 Race Code PHIN CDC Nested Level 1	Race Category Code maintained by CDC. Replaces equivalent values in table HL7 005 OID - 2.16.840.1.113883.12.5

Note: any program specific additional values added to HL7 User Define Tables are found in Appendix D.

Appendix D - User-Defined Valid Values

Table D-1 : ACS Clinical Alert Codes for OID 2.16.840.1.113883.13.24

Code	Message Description
105000	Asthma: Absence of controller with ED/hospitalization
105001	Asthma: Absence of controller with SA beta agonist use
105002	Asthma: History of ED visit in the last 365 days
105003	Asthma: History of hospitalization in the last 365 days
105004	Asthma: ICS non-compliance with ED/hospitalization
105005	Asthma: ICS non-compliance with SA beta agonist use
105006	Asthma: No influenza vaccine in the last 365 days
105007	Asthma: Non-ICS non-compliance with ED/hospitalization
105008	Asthma: Non-ICS non-compliance with SA beta agonist use
105009	Diabetes: LDL above goal <100mg/dl not on lipid med
105010	Diabetes: LDL above goal <100mg/dl on lipid med
105011	Diabetes: No A1c in the last 365 days
105012	Diabetes: No eye exam in the last 365 days
105013	Diabetes: No influenza vaccine in the last 365 days
105014	Diabetes: No lipid panel in the last 365 days
105015	Diabetes: No urine protein in the last 365 days
105016	Diabetes: Triglycerides above goal <150mg/dl
105017	Compliance: Doxazosin
105018	Compliance: Terazosin
105019	Optimize Daily Dose - Doxazosin
105020	Optimize Daily Dose - Terazosin
105021	Compliance: Fosinopril
105022	Compliance: Lisinopril
105023	Compliance: Moexipril
105024	Compliance: Ramipril
105025	Compliance: Trandolapril
105026	Optimize Daily Dose - Fosinopril
105027	Optimize Daily Dose - Lisinopril
105028	Optimize Daily Dose - Moexipril
105029	Optimize Daily Dose - Perindopril
105030	Optimize Daily Dose - Ramipril
105031	Optimize Daily Dose - Trandolapril
105032	Compliance: Candesartan
105033	Compliance: Irbesartan
105034	Compliance: Lorsartan
105035	Compliance: Olmesartan
105036	Compliance: Telmisartan
105037	Compliance: Valsartan
105038	Optimize Daily Dose - Candesartan
105039	Optimize Daily Dose - Irbesartan
105040	Optimize Daily Dose - Losartan
105041	Optimize Daily Dose - Olmesartan

Code	Message Description
105042	Optimize Daily Dose - Telmisartan
105043	Optimize Daily Dose - Valsartan
105044	Compliance: Amlodipine/Benazepril
105045	Compliance: Lisinopril/HCTZ
105046	Compliance: Losartan/HCTZ
105047	Compliance: Moexipril/HCTZ
105048	Compliance: Quinapril/HCTZ
105049	Compliance: Valsartan/HCTZ
105050	Optimize Daily Dose - Benazepril/HCTZ
105051	Optimize Daily Dose - Lisinopril/HCTZ
105052	Optimize Daily Dose - Losartan/HCTZ
105053	Optimize Daily Dose - Moexipril/HCTZ
105054	Optimize Daily Dose - Quinapril/HCTZ
105055	Optimize Daily Dose - Valsartan/HCTZ
105056	Compliance: Amlodipine
105057	Compliance: Felodipine
105058	Compliance: Nifedipine SR
105059	Compliance: Nisoldipine
105060	Compliance: Verapamil 24hr SR PM
105061	Optimize Daily Dose - Amlodipine
105062	Optimize Daily Dose - Felodipine
105063	Optimize Daily Dose - Nifedipine SR
105064	Optimize Daily Dose - Nisoldipine
105065	Optimize Daily Dose - Verapamil 24hr SR PM
105066	Incr ADE: ACE & K+ sparing, 1MD
105067	Incr ADE: ACE & K+ sparing, >1MD
105068	Incr ADE: ACE & K+ suppl, 1MD
105069	Incr ADE: ACE & K+ suppl, >1MD
105070	Incr ADE: ACE+K sparing+K suppl, 1MD
105071	Incr ADE: ACE+K sparing+K suppl, >1MD
105072	Incr ADE: Eplerenone and Potassium supplements
105073	Incr ADE: Eplerenone and Potassium-sparing diuretics
105074	Due for #1 DTaP vaccination
105075	Due for #2 DTaP vaccination
105076	Due for #3 DTaP vaccination
105077	Due for #4 DTaP vaccination
105078	Due for #5 DTaP vaccination
105079	Potential DTaP catch-up
105080	Due for #1 Hep A vaccination
105081	Due for #2 Hep A vaccination
105082	High Risk Hep A
105083	Due for #1 Hep B vaccination
105084	Due for #2 Hep B vaccination
105085	Due for #3 Hep B vaccination
105086	Potential Hep B catch-up
105087	Due for #1 Hib vaccination
105088	Due for #2 Hib vaccination
105089	Due for #3 Hib vaccination
105090	Due for #4 Hib vaccination

Code	Message Description
105091	Due for #1 HPV vaccination
105092	Due for #2 HPV vaccination
105093	Due for #3 HPV vaccination
105094	Due for influenza vaccination
105095	Due for meningococcal vaccine
105096	Potential meningococcal catch-up
105097	Potential meningococcal vaccination needed
105098	Due for #1 MMR vaccination
105099	Due for #2 MMR vaccination
105100	Potential MMR catch-up
105101	Due for #1 PCV vaccination
105102	Due for #2 PCV vaccination
105103	Due for #3 PCV vaccination
105104	Due for #4 PCV vaccination
105105	Potential PCV catch-up
105106	High risk pneumococcal vaccination
105107	Due for #1 polio vaccination
105108	Due for #2 polio vaccination
105109	Due for #3 polio vaccination
105110	Due for #4 polio vaccination
105111	Potential polio catch-up
105112	Due for #1 rotavirus vaccination
105113	Due for #2 rotavirus vaccination
105114	Due for #3 rotavirus vaccination
105115	Due for Tdap vaccination
105116	Potential Tdap catch-up
105117	Due for #1 varicella vaccination
105118	Due for #2 varicella vaccination
105119	Potential varicella catch-up
105120	A1c: above goal
105121	CHD/CHD risk equiv: LDL above goal <100mg/dl on lipid med
105122	CHD/CHD risk equiv:LDL above goal <100mg/dl not on lipid med
105123	CHD/CHD risk equivalent: consider LDL goal of <70mg/dl
105124	Diabetes: consider LDL goal of <70mg/dl
105125	Elevated microalbumin
105126	HDL: high
105127	HDL: Low (female)
105128	HDL: low (male)
105129	LDL: above goal of <130mg/dl
105130	LDL: above goal of <160mg/dl
105131	LDL: above goal of <160mg/dl and >/=190mg/dl
105132	LDL: may be at goal
105133	LDL: may be at goal (>/= 2 risk factors)
105134	Total Cholesterol: Borderline
105135	Total Cholesterol: Borderline
105136	Total Cholesterol: High
105137	Triglycerides: borderline
105138	Triglycerides: high not on lipid meds
105139	Triglycerides: high on lipid med

Code	Message Description
105140	Triglycerides: very high not on meds
105141	Triglycerides: very high on meds